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Monthly Message

A letter received recently by a United States Senator from one of the New England states related the following incident: While in Japan, a lady awoke one morning with a severe pain in one arm and was unable to move it. Ascertaining that there was a large American hospital in the city she and her husband went there at 9:00 a. m. to seek advice and help. They were given an appointment at 3:00 p. m. On returning to the hospital at the appointed hour, "she was informed that the doctor refused to see her as she didn't belong to the armed services. She came out crying as the pains got worse and was dumbfounded by this treatment. She finally was able to obtain treatment from a Swiss physician. Some remarks we heard from other Japanese people were: 'Is this the American Democracy you are trying to teach the world?'"

One scarcely needs to ask the question, "What is wrong with this picture?" All who profess to be doctors should constantly bear in mind an axiom well expressed by the late Dr. Ferdinand Sauerbruch in 1929: "To be a physician is to be a servant of the sick." Furthermore, it is the duty of the physician to do more than he has to, and to give of himself generously. Finally, all doctors in the Armed Forces must remember that they not only represent the medical and dental professions, but they are also officers of the Armed Forces of the United States and as such have the opportunity and duty each day to serve as representatives of this country; and, dependent on their own actions and way of life, good will will accrue, both among their fellows in arms and fellow Americans, and also among the people of the countries in which they are stationed.

Frank B. Berry

FRANK B. BERRY, M. D.
Assistant Secretary of Defense
(Health and Medical)

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Foreword

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

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THE INTERMEDIATE CORONARY SYNDROME

ASHTON GRAYBIEL, *Captain (MC) USN*

PERSONS with disease of the coronary arteries are subject to "attacks" which may be looked upon as complications of this underlying pathologic state. There is general agreement regarding the use of the terms angina pectoris and myocardial infarction in describing two types of attacks, but these terms do not include all attacks. Attempts have been made to fill this gap by describing "severe" forms of the anginal syndrome[1,2] and "mild" types of infarction.[3-6] Another approach has been to describe additional types of attacks which are essentially distinct syndromes. In an important article, Blumgart and his associates[7] proposed the term "coronary failure" to designate episodes in which patients suffered cardiac pain more prolonged than that consistent with angina pectoris, yet in whom there was neither clinical evidence of myocardial infarction nor was it found at post mortem. They pointed out that these attacks sometimes coincided with factors known to increase the work of the heart or decrease its blood supply but if they occurred under circumstances previously known to provoke pain the clinical diagnosis of "coronary failure due to acute coronary occlusion" is justifiable. In 1948, Freedburg and associates[8] amplified the original description and extended the concept to include patients who exhibited slight systemic responses to the injury and whose electrocardiograms showed slight transitory changes of the RS-T segment and the T wave.

Shortly after Blumgart and associates' original article appeared, Master and co-workers[9] introduced a new classification of coronary heart disease emphasizing the differentiation between angina pectoris, acute coronary occlusion, and acute coronary insufficiency. They redefined acute coronary occlusion as complete obstruction of a coronary artery with massive confluent myocardial infarction. Acute coronary insufficiency fell between

From U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla.
Presented before the Section on Military Medicine of the American Medical Association at the annual meeting of the American Medical Association in San Francisco, 24 June 1954.

angina pectoris and coronary occlusion, and they stated that "the clinical picture may simulate coronary occlusion or there may be no symptoms at all but the electrocardiogram and the pathological changes are specific." It was pointed out in further reports[10] that a wide variety of etiological factors acted as predisposing or precipitating agents.

Our experience in dealing with patients suffering from coronary heart disease has also emphasized the need for additional categories which would aid the clinician in the handling of these cases.[11] From a practical standpoint, such categorization must be capable of sharp definition and should be based on clear-cut clinical indicators and not on obscure pathophysiologic mechanisms. In our opinion, it is relatively easy and very much worth while to distinguish a type of acute attack due to coronary heart disease which is intermediate in severity between angina pectoris and myocardial infarction. In the brief account which follows, chief emphasis will be placed on the differential diagnosis from the clinical point of view.

The *intermediate coronary syndrome* is defined as an acute attack complicating coronary heart disease in which evaluation of the pain distinguishes it from the anginal syndrome, and evaluation of the other clinical findings distinguishes it from myocardial infarction. We prefer the term "intermediate coronary syndrome" to coronary failure both because it suggests the relationship to angina and infarction and because its meaning is univocal. However, our clinical observations agree so well with those reported by Blumgart and his associates that a general identity of the cases to be placed in this intermediate category may be assumed.

DIAGNOSIS

Diagnosis of the intermediate coronary syndrome is most readily made by excluding the angina syndrome on the one hand and myocardial infarction on the other. Advantage can be taken of the fact that by introducing this intermediate category the criteria for the diagnosis of the angina syndrome and myocardial infarction can thereby be sharpened. Although coronary atherosclerosis is to be regarded as the chief predisposing factor, this aspect of the diagnosis will be considered here only insofar as it appears in the differential diagnosis.

The differentiation between the anginal and intermediate syndrome should be based mainly on a careful evaluation of the symptom, pain. The more important aspects of this evaluation concern not so much the characteristics of the pain *per se* but such factors as the history of previous attacks, the circumstances attending the onset and cessation of pain, and the uniformity or lack of it in the clinical picture of the attack.

The true anginal attack is usually a mild affair in a person with severe heart disease. Frequently there is a history of repeated attacks with gradually decreasing reserve over a relatively long time. The patient is usually aware of the factors which may bring on the pain and the circumstances or remedies which can be counted on to relieve it. Having experienced an attack, he feels no worse because of it and may even enjoy a brief period thereafter during which exercise tolerance is increased. One attack is much like another and patients are quick to appreciate any significant change in symptoms.

Prolonged duration is the single most important characteristic of the pain itself which suggests the occurrence of something more severe than the anginal syndrome. This should be suspected if the pain lasts longer than a few minutes after the precipitating factor is no longer present or after the administration of a vasodilating agent such as nitroglycerin. The location, radiation, and severity of the pain are far less important as differential clues.

Much more significant than the character of the pain are the circumstances attending the onset. Pain arising spontaneously, or at least without obvious cause, usually declares something more severe than the anginal syndrome. Even though the pain is related to factors which increase the work of the heart, the anginal syndrome is unlikely if this represents either a sudden or great reduction in exercise tolerance; it is even more unlikely in the case of an initial attack.

Lack of similarity in the attacks points away from the diagnosis of angina pectoris. This is particularly true with regard to the readiness with which the pain is precipitated, change in the location, character, or radiation of the pain, and the ease with which relief is obtained. Less important are such factors as the number of attacks, the severity of the pain, and small changes in exercise tolerance.

Differentiation between myocardial infarction and the intermediate syndrome is not difficult if the definition of infarction is kept in mind. It may be worth while to recall that an infarct is "an area of coagulation necrosis in a tissue due to local anemia resulting from obstruction of circulation to the area." This is a formidable diagnosis to make on the basis of clinical findings unless they are definite and clear cut. Although infarction may be strongly suspected on the basis of the sudden onset of pain characteristic of myocardial ischemia and the symptoms of heart failure, yet the diagnosis is not definite until either there are changes in the electrocardiogram pathognomonic of the systemic response, attributable beyond reasonable doubt, to the absorption of necrotic material from the heart. Even the appearance of

a friction rub indicating pericarditis cannot be taken as definite evidence of infarction unless it "fits" into the rest of the clinical picture. In the absence of any pathognomonic indicator it may be difficult, almost a matter of opinion, to decide when the "total clinical picture" can be taken as proof of infarction.

Except for pain, it is the paucity of symptoms in the intermediate coronary syndrome which suggests that myocardial infarction has not occurred. The physical examination often reveals little that can be regarded as abnormal. The patient may appear well, the heart not enlarged, the rhythm regular, and the heart sounds of good quality. The blood pressure may be normal and there may be no evidence of heart failure.

Serial electrocardiograms often reveal significant alterations usually lasting for brief periods. Depression of the RS-T segments and lowering or inversion of the T waves are the changes most frequently observed. However, we have observed one instance consisting of the sudden appearance of Q waves in leads II and III, followed by their sudden disappearance, and one instance of the temporary appearance of right bundle branch block. Sometimes significant electrocardiographic changes are not observed and the question arises whether or not to obtain records with the patient exposed to anoxia or after exercise. In our opinion there is a serious risk in so doing; we have always delayed in carrying out these tests until it was deemed entirely safe. Possibly because of this delay, they were found not to be very helpful. The most useful procedure is to obtain records at very frequent intervals in the hope of "capturing" ephemeral alterations.

Definite evidence of a generalized systemic response which can reasonably be attributed to absorption of necrotic material from the heart is lacking. If frequent determinations of the white blood cell count and the sedimentation rate are carried out, a "pattern" may be established which will furnish a clue to the diagnosis of myocardial necrosis. However, individual variation, reliability of technic, and the nonspecific character of these tests must be kept in mind in the evaluation of such results.

CLINICAL COURSE

The clinical course is usually very mild unless complications arise. Indeed, it is sometimes difficult to keep the patient under proper observation until such time as the symptoms are no longer regarded as a possible prelude to myocardial infarction. In some instances a series of attacks of pain over a period of a week or longer may make it seem likely that severe damage to the heart has occurred, but there may be no evidence of infarction. Complications may arise suddenly without warning or gradually in which case they may be declared solely by alterations in the

laboratory findings. It is the most frequent complication, but sudden death due presumably to ventricular fibrillation may occur.

TREATMENT

Treatment of the acute symptoms rarely presents a problem but expert judgment is required to avoid, on the one hand, instituting unnecessary measures yet, on the other, to take adequate precautions in view of the possibility of myocardial infarction developing. A period of observation is essential during which time it is desirable to obtain serial electrocardiograms and to determine if there is a systemic response to tissue necrosis. The patient may be allowed the freedom of a room but anything more strenuous should be avoided, including stressful diagnostic procedures. The individualization of treatment should be based not only on the initial clinical picture and the evolutionary changes which may follow but on such factors as the age of the patient, the nature and degree of underlying disease and disorders, and the feasibility of carrying out measures which might be recommended. Physical, psychologic, and economic factors must all receive consideration.

The use of anticoagulant drugs will nearly always come up for consideration. In a relatively young and otherwise healthy person with mild symptoms, who is suffering an initial attack, the indications point away from rather than toward this therapy.

DISCUSSION

This attempt to distinguish a particular type of coronary heart disease differs from other such attempts in various respects or degrees. It resembles other attempts in that the symptomatology is anchored to the anginal syndrome, on the one hand, and the myocardial infarction on the other. It differs in that it delimits a smaller but more homogeneous group of cases. Thus, it is far less inclusive than the syndrome "acute coronary insufficiency" described by Master and his associates.[10] It excludes all instances where the principal predisposing factor is not coronary heart disease. It is assumed that symptoms are due to myocardial ischemia but as Blumgart and his associates[12] have shown so well, different pathologic mechanisms may be involved.

It might be objected that the intermediate coronary syndrome may represent the premonitory phase of myocardial infarction and that a final diagnosis can be made only in retrospect. This objection leaves the clinician with the alternative of making a diagnosis of infarction before the fact. It is true that an initial diagnosis of the intermediate coronary syndrome will often have to be changed but this disadvantage is outweighed by the advantages. From the clinical point of view, there can hardly be any objection to making a diagnosis based on the findings up to

the moment; it is better to wait until the evidence is adequate before making a diagnosis of infarction. Furthermore, by introducing a middle category the way is clear to define more sharply the anginal syndrome and myocardial infarction; we can eliminate such terms as "status angiosus" and "atypical" infarction. Increasing experience will lead, almost surely, to a sharper distinction between the intermediate coronary syndrome and myocardial infarction based on the initial signs and symptoms, and this will pave the way toward better treatment.

The choice of a term to distinguish this middle group is important, otherwise it will not win general acceptance. It should not have an anatomic or pathophysiologic connotation which might apply equally well to something else. Scherf and Golbey[13] have emphasized this point with regard to the term coronary insufficiency. It is also better to introduce a new term than to attempt to redefine an old one.

SUMMARY

The intermediate coronary syndrome may be defined as a complication of coronary heart disease in the nature of an acute attack which is distinguishable from the anginal syndrome by an evaluation of the pain and distinguishable from myocardial infarction by the absence of the characteristic signs and symptoms of infarction. This syndrome is limited to cases in which the predisposing factor is coronary heart disease, and the precipitating factors may be obvious or obscure. The characteristic clinical picture includes pain, nonspecific electrocardiographic changes, minimal or equivocal systemic effects, and little, if any, evidence of circulatory failure.

Differentiation from the anginal syndrome is usually easy because symptoms either develop spontaneously or there is a dramatic decrease in exercise tolerance literally from one day to the next. Differentiation from myocardial infarction is based mainly on the absence of electrocardiographic alterations considered to be pathognomonic of myocardial infarction, and the absence of systemic effects or a friction rub attributable to myocardial necrosis.

The clinical course is usually short and ends with recovery or the development of further injury, usually infarction. The treatment should include the relief of any obvious precipitating factor, the possible use of anticoagulant drugs, and a period of observation beyond which complications are unlikely.

The advantages in differentiating this middle category of cases of coronary heart disease include (1) the possibility of defining more sharply the anginal syndrome and myocardial infarction, and (2) the stimulation of interest in the early recogni-

tion and treatment of complications of coronary heart disease which are not likely to end in infarction.

The term intermediate coronary syndrome would seem to meet the clinical requirement in designating these cases.

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SPECIFIC ANTIBIOTIC THERAPY

From year to year more and more cases are failing to respond to antibiotics indiscriminately selected and administered in the treatment of infections. These facts point to the necessity for determining as quickly as possible by means of laboratory tests the causative organisms and their sensitivity to the available antibiotics. When this knowledge has been gained, the most potent antibiotic or combination of antibiotics should then be employed in the treatment of the case.

—FRANK L. MELENEY, M. D., and
BALBINA A. JOHNSON, B. A.
in *Surgery, Gynecology and Obstetrics*, p. 275, Sept. 1953

GASTRECTOMY IN THE TREATMENT OF PEPTIC ULCER IN THE AIR FORCE

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THE criteria for gastrectomy in the patient with peptic ulcer have been agreed upon by surgeons all over the world for many years. In general there are six major indications: massive hemorrhage, gastric ulcer, obstruction, chronic recurrence, repeated hemorrhage, and intractability. Theoretically these indications are clear, but the proper interpretation in the individual case is often difficult. This is particularly true in military practice because of the intangible factor of motivation. There are some instances when one is forced to operate on a patient who is known to be poorly motivated for military service; however, one should never be guilty of doing an elective operation of this magnitude and later find that the patient was poorly motivated all the time. Every peptic ulcer patient being considered for an elective gastrectomy should have a thorough neuropsychiatric evaluation prior to operation, and if it is determined that the patient is poorly motivated and/or will not become adjusted to the service, separation from the service should be considered as the best definitive answer. Particularly in the military service should definitive surgical procedures be reserved for the true medical failures and those cases where operation is urgently indicated to save a life.

MASSIVE HEMORRHAGE

The proper treatment of this condition is still controversial, as is reflected by the magnitude of articles in the literature in recent years. Ivy and others[1] stated that most patients would respond to medical therapy and whole blood transfusions, but that a few (probably five percent) would bleed to death in spite of the best medical management. Holman[2] reported a 13-percent mortality in 161 patients treated conservatively at the New York Hospital from 1932 to 1939. He stated that most patients could be easily controlled, but that there was a 50-percent mortality in two groups of patients: those who continued to bleed from 24 to 48 hours after being placed on strict medical management, and those who started to bleed in the hospital while under strict medical man-

From 5005th Medical Group, APO 942, Seattle, Wash.

agement. Since 1940 it has been that hospital's policy to perform immediate operation on patients in these two groups; the result has been a drop in mortality to five plus percent in 257 patients. Stewart and others[3] and Welch[4] have shown that early gastric resection definitely outweighs the risk from continued bleeding.

In this day of blood banks and improved methods of conservative management, a combined medical and surgical program should realize the best possible results. Daly and associates[5] in 1948 reported excellent results with the use of phosphate buffer and topical thrombin, and in 1951 Cantor and co-workers[6] reported almost equal control with absorbable gelatin sponge (gelfoam) and thrombin. Bowers and Rossett[7] treated 150 patients by combined medical and surgical management, with a mortality of 1.3 percent.

The combined medical-surgical routine advocated by Daly and others has been found to be a most excellent and satisfying method of control in these difficult to handle patients. Control is usually immediate and when it is not it is readily obvious. Also, of great importance, one is usually aware of fresh bleeding after control long before this unhappy situation is recognizable by the clinical picture. Early surgical intervention should be resorted to if control of hemorrhage cannot be maintained. Crohn,[8] in a collective review of the literature, recently reported a 10-percent average operative mortality in those patients operated on in the first 24 to 48 hours of bleeding, and a 25-percent average mortality in those operated on after 48 hours of hemorrhage. It is pointed out that, for obvious reasons, patients over 40 years of age may be more difficult to manage conservatively. Therefore, immediate surgical intervention should be considered in this group when the slightest indication of failure exists. Crohn found a mortality of from 15 to 25 percent in hemorrhaging patients over 45 years of age treated medically, and advocated prompt operative treatment provided competent surgical care was available. In the average surgeon's hands a patient will have a better chance for recovery and subsequent good health if gastrectomy is performed as an elective procedure under optimum conditions rather than as an emergency. Therefore, if hemorrhage is controlled, operation should be postponed until the patient and the surgeon are in the best possible condition for it, even though it is obvious from the onset that the patient should eventually be operated on.

GASTRIC ULCER

In recent years the concept that gastric ulcer is primarily a surgical disorder has become widely accepted. This belief developed mainly because there is no positive clinical or laboratory means of differentiating between benign and malignant ulcers. It is not generally believed that benign ulcers if untreated will

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undergo a malignant change, but that a primary malignant ulcer may be treated medically and the opportunity for surgical cure lost. Marshall[9] in 1953 reported a series of 411 consecutive gastric ulcers of which 15.8 percent were malignant. He stated that there was insufficient histologic evidence to warrant a conclusion that gastric ulcers present a greater disposition to malignancy. He believed, however, that secondary malignant degeneration would unquestionably occur in some chronic gastric ulcers but probably not in more than five to six percent. Ravdin and Horn[10] in 1953 emphasized the fallibility of present diagnostic technics, and found at operation that 11 percent of 94 ulcers which had been clinically diagnosed as benign were actually malignant. They believed that upwards of 10 percent of chronically benign ulcers may develop a malignancy at the ulcer site. Ewing[11] and Mallory[12] stated that malignant degeneration rarely occurred in a benign gastric ulcer. The former stated that such an origin of malignant ulcer probably accounted for not more than two to three percent of gastric carcinomas.

An editorial[13] has stated that the dictum that all gastric ulcers should be removed following confirmed diagnosis is rapidly losing its authority. Most internists and surgeons recommended at least a preliminary trial of medical management for a few weeks or months, and some favored continuing medical treatment. The rather common belief that all ulcers of the greater curvature of the stomach are malignant is certainly not true. In Marshall's series of 346 benign gastric ulcers, 10 (three percent) were on the greater curvature, and of the 65 malignant ulcers, two (three percent) were on the greater curvature. Only in the antrum and fundus was the incidence of malignant ulcer higher than that of benign ulcer.

It is believed that each case should be individualized, and, if the ulcer seems unquestionably benign clinically and radiologically, a rigidly controlled medical program may be instituted. If the ulcer is benign, there should be rapid relief of symptoms and roentgenographic evidence of healing within four to five weeks. If healing does not occur within this period, surgical intervention is certainly indicated. On the other hand, if healing takes place, careful follow-up should be carried out for from six months to a year. Any recurrence following apparent healing is an indication for surgical intervention.

OBSTRUCTION

Gastric retention occurs in about 25 to 30 percent of all patients with gastric and duodenal ulcers. Of this group, however, only 20 percent of those with gastric ulcers and 10 percent of those with duodenal ulcers have organic obstruction. With proper conservative management, gastric retention in the remaining

patients disappears. Experience certainly teaches that every patient with pyloric obstruction should be given a trial of strict medical management. If the condition is not relieved, then operation is indicated.

CHRONIC RECURRENCE AND REPEATED HEMORRHAGE

Chronic recurrence and repeated hemorrhage as an indication for operation are observed together just about as often as each is singly. Individually, each indicates only a relatively mild need for operation and their occurrence together is hardly more of an excuse for surgical intervention. Jahiel[14] stated that it is well-established that a periodic pattern of attacks and recovery characterizes the natural history of uncomplicated peptic ulcer. Ivy and his associates stated it is uncertain whether repeated recurrence of hemorrhage in patients who are not under strict management should be an indication for operation. They further stated that studies have shown that, after apparent cure, patients with bleeding ulcers tend to have recurrence of their ulcer with hemorrhage more frequently than do patients with nonbleeding ulcers. They emphasized that collected data from the literature indicates that subsequent hemorrhages are generally no more dangerous than the first. It is most important, however, not to confuse repeated small hemorrhages with massive hemorrhage.

Of course, in a situation where a person is in the hospital so often that he is no longer effective on his job, something has to be done. In civilian life many patients who have a gastrectomy for these indications are in reality operated on at their request because of the nuisance of long periods of diet and repeated difficulties after breaks in their medical routine. In such instances, results will probably be satisfactory because the patient, realizing what he is getting into, is desirous of the operation and assumes part of the responsibility for the results. This is not true in military practice, however, because the government ends up with the full responsibility for the results. One should never lose sight of the fact that the responsibility for the health and subsequent effectiveness of the particular patient after surgical intervention rests with the surgeon.

INTRACTABILITY

Intractability appears to be an uncommon indication for operation in the Air Force. The typical intractable ulcer is one which recurs chronically, and which does not respond to medical management during the acute episode or flares up as soon as strict medical management is relaxed. Many patients whose ulcers appear to be intractable will be helped by a change in their treatment or by the addition of psychotherapy to remove stress factors. Recently such a patient was seen at this hospital. A 23-year-old man with two years' service, had had aerophagia

practically all his life, and particularly in time of stress. Nine months prior to admission he had had episodes of epigastric pain and belching relieved by sporadic medical treatment. On arriving in Alaska, leaving a young wife and seven-month-old baby at home, his discomfort became pronounced. He reported to his dispensary where he was given aluminum hydroxide gel (amphojel) and was examined radiologically. The roentgenogram was negative but his symptoms became worse. He was then transferred to this hospital and treated with bed rest, a combination of phenobarbital and belladonna, aluminum hydroxide gel, and milk and cream for one week, but his symptoms became more pronounced. Roentgenograms revealed a definite duodenal ulcer. Gastric analysis with histamine stimulation gave a peak of 79° free acid and 110° total in one hour. His pain became more severe, there were more episodes of vomiting, and nightly retention ranged from 200 to 300 cc., containing an average of 70° free and 95° combined acid. A gastric tube was passed, and after three days of suction he felt better and seemed to be doing well on an aluminum hydroxide gel regimen; however, 48 hours later he was again in trouble and complaining bitterly. At this time it was believed that the ulcer was probably intractable. In surgical consultation it was suggested that the stress of being separated from his family might be a factor in his failure to respond to apparently adequate medical therapy. Whereupon the gastric tube was replaced and the patient informed that if he responded quickly to medical treatment he would be sent back to the continental United States, but if not an operation would have to be performed. His outlook changed immediately to one of cheerful anticipation. Suction was continued for 48 hours, at the end of which time he was again placed on a Sippy regimen. His recovery was rapid and without remission. The lesion healed and the patient was evacuated to the continental United States for further treatment and evaluation. The patient could have easily been operated upon, and if he had been, the result would most probably have been poor.

PRELIMINARY REPORT

In the fall of 1952 a long-range study of patients with peptic ulcers who had gastrectomies in Air Force hospitals was inaugurated. It was hoped that a series of at least 200 cases could be obtained. To date only 59 have been collected; however, as these patients came from only seven Air Force hospitals and there are some 125 hospitals in the service, it is hoped that the original goal will eventually be reached. Thirty-nine of these cases were in military personnel with one or more years elapsed since operation. Questionnaires were sent to these 39 patients, and answers were received from 36 by March 1954. This report will be limited to a review of these 36 patients.

Thirty-five were men and one a woman, the latter a captain in the Air Force Nurse Corps. Thirty-one percent were officers and 69 percent were enlisted men. The ages ranged from 23 to 58 years, 31 percent falling between the ages of 23 to 29; 42 percent, between 30 and 39; and 27 percent, being 40 years of age or over. Thirty-six percent of the patients had less than eight years of service at the time of operation, and 64 percent had eight or more years. The average length of service was 11 years, with a spread of from one to 37 years. The average duration of symptoms prior to gastrectomy was four years, with a spread of from 0 to 12 years.

All patients presented at least one of the six major indications for surgical intervention discussed previously. For purposes of study the patients were divided into two groups—those having urgent indications, and those with possibly questionable indications. Those with urgent indications—massive hemorrhage, gastric ulcer, and obstruction—comprised 52.8 percent of the patients. Those with questionable indications—chronic recurrence, repeated hemorrhage, and intractability—comprised 47.2 percent. Interestingly enough, many of the patients in the questionable group presented more than one of the three indications.

The operative procedures employed were numerous, but Polya's operation or some modification thereof was the most frequent choice. Only nine patients (25 percent) were estimated to have had more than 75 percent of the stomach removed, and the remaining 75 percent were estimated to have had 75 percent or less of the stomach removed.

Half of these patients have been followed for more than one year postoperatively, and 28 (88 percent) were still on active duty. Of the eight patients no longer on active duty, three were normally separated and five were retired. The series is too small and the follow-up too short to furnish conclusive data, but some points of interest have been derived.

In evaluating the results, the patients were divided into three groups: group 1, those with excellent results; group 2, those with satisfactory results; and group 3, those with poor results.

Patients were considered to be in group 1 if they were on a regular diet and had absolutely no complaints. Group 2 comprised those well-motivated patients who had mild dumping syndromes or other vague complaints, but who had not been deterred from continuing on active duty. Also included were those patients with these mild complaints who were separated from the service through normal channels but who were able to engage in a useful civilian occupation. One of this latter group was a pilot who re-

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signed his commission because he was permanently grounded and who is now a civilian airlines pilot.

Group 3, the remainder of the series, comprised patients having severe dumping syndromes and proved recurrences, and included persons retired and pensioned because of persistence of their symptoms after operation, or simply because he or she had had a gastrectomy. It is pointed out that a patient with an excellent medical result may be a military failure if he is retired from the military service and pensioned because of his operation. Certainly the results of an elective procedure which are the basis for retirement and pension should not be considered satisfactory. An example is one patient in this series, a 30-year-old technical sergeant with six and one-half years' service, who had a gastric resection because of repeated hemorrhage. A short time later he was presented to a physical evaluation board because his time of enlistment was up and he did not desire to continue on active duty. He was awarded a 50-percent permanent disability and now, two years later, is a civilian enjoying excellent health and a monthly Government check.

The results in 20 patients (56 percent) were classified as excellent; in eight (22 percent) as satisfactory; and in eight (22 percent) as poor. Therefore, 78 percent of the entire group fell in either the excellent or satisfactory category, a tolerable proportion but still less than that reported in the better civilian clinics. Milstein[15] reported satisfactory results in 86.7 percent of 90 patients with gastrectomies followed out of 101 operated on between 1940 and 1947. Rauch[16] in 1952 reported failures in only 10.4 percent of 702 patients operated on between 1940 and 1950. Harvey and others[17] in 1953 reported excellent results in 85 percent of 394 patients followed for from five to 15 years.

Of interest, but of no direct bearing on final results, it was found that 91.6 percent of the 36 patients in our series smoked after the operation, and 77.7 percent drank alcoholic beverages. All patients with excellent results were smokers. All of the patients believed that the operation was of either great or moderate value. Eighty-three percent considered that the operation was of great value and 17 percent believed that it was of moderate value. As might be expected, all the patients with excellent results considered the operation of great value. Those who believed that they derived only moderate value from the operation were equally divided between the satisfactory and poor groups.

Basically, there are two factors which have the greatest influence on the results of definitive treatment of peptic ulcer patients. These are (1) proper selection of patients and (2) adequate surgery. If selection is careless, even though the operation may be adequate, the results are likely to be mediocre;

conversely, if selection is proper and the operation inadequate, similar results will be observed. If selection is proper and the operation adequate, the results should compare favorably with the highest standards.

In an effort to see if there was any relation between these two factors and the results obtained, the excellent and satisfactory groups were combined to form one group, designated "good."

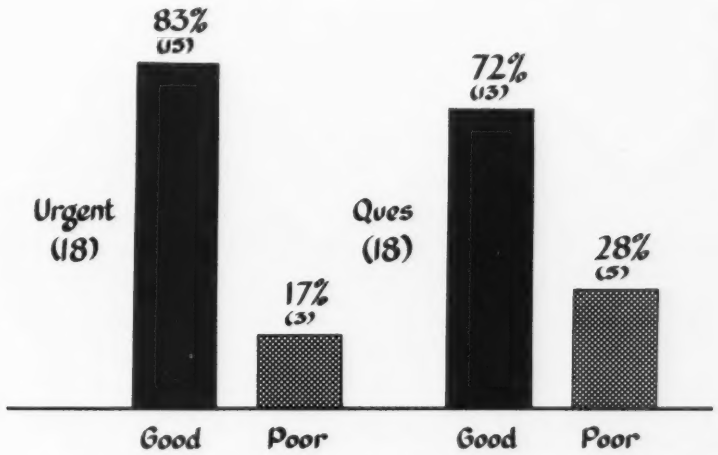

Figure 1. Relation between indications and results. There is a 12-percent differential favoring the urgent group.

Of the 19 patients who had urgent indications for surgical intervention, 16 (84 percent) had good results (either excellent or satisfactory), and three (16 percent) had poor results. Of the 17 patients with questionable indications, only 71 percent had good results and 29 percent had poor results, a difference of 12 percent favoring the urgent group (fig. 1).

Of the 23 patients with eight or more years' service, 19 (83 percent) had good results, and four (17 percent) had poor results. Of the 13 patients with under eight years' service, only nine (69 percent) had good results while four (31 percent) had poor results, a difference of 14 percent favoring the longer service group (fig. 2).

Only nine patients were estimated to have had more than 75 percent of the stomach removed; eight (89 percent) had good results, and only one (11 percent) had poor results. Of the 27 patients estimated to have had 75 percent or less removed, only 20 (74 percent) had good results, and seven (26 percent) had poor

results, a difference of 15 percent favoring the more radical procedure (fig. 3).

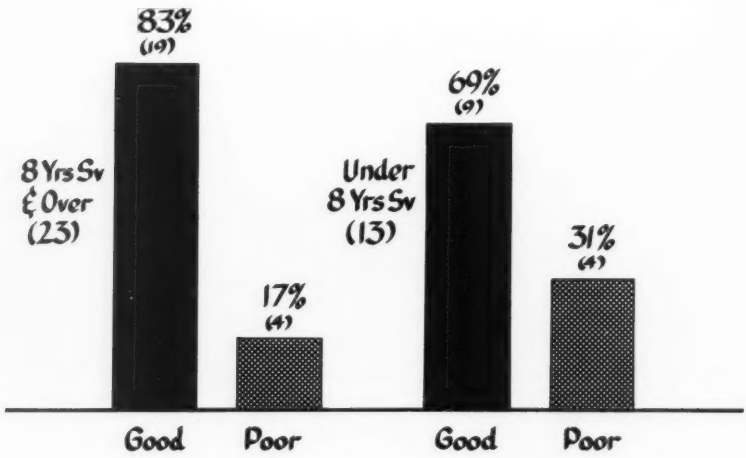

Figure 2. Relation between length of service and results. There is a 14-percent differential favoring the group with eight or more years of service.

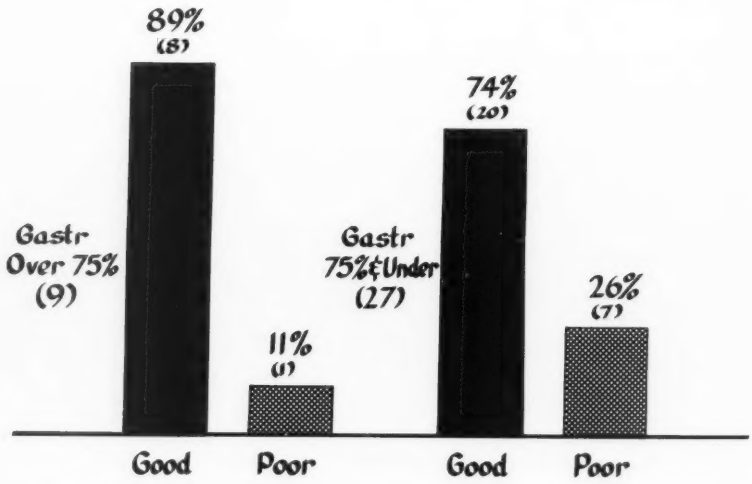

Figure 3. The relation between the amount of stomach removed and results. There is a 15-percent differential favoring the group with more than 75 percent of the stomach removed.

SURGICAL TREATMENT

The definitive surgical treatment of peptic ulcer patients should be aimed toward the physiologic reduction of gastric acidity and motility. This is best accomplished by resecting the acid-forming portion of the stomach, neutralizing the gastric contents with duodenal contents, and/or interrupting the nervous innervation of the stomach.

Again using the large number of recent publications on the subject as an indication, the best method of accomplishing this end is still somewhat controversial. A gastric resection of 75 percent of the stomach or more seems to be the procedure most widely used. By present-day standards, it gives uniformly excellent results in properly selected cases, with a minimum of mortality and morbidity. In cases where the acid response is unusually high and it is technically feasible, a resection of 80 to 85 percent of the stomach should be performed.[18] If the psychosomatic component is pronounced it is believed that vagotomy is a valuable supplement to resection. The exact evaluation of the severity of the psychosomatic component is difficult to make, and is determined to a great degree by experience. The type of person for whom a vagotomy is indicated is one who has been described as a "gastric personality." If the resection is technically difficult, division of the vagus nerves may permit a more adequate mobilization of the esophagus and gastric cardia, thereby facilitating a higher resection.

It is desirable to remove the ulcer itself whenever possible as it has been shown that if the ulcer is not resected postoperative recurrences are more likely. The American Gastroenterological Association[19] reported that the response was favorable in from 81.2 to 89.1 percent of those patients whose ulcers were removed, whereas it was favorable in only 65.5 to 78.8 percent of those whose ulcers were not removed. It is not believed advisable, however, to risk injuring the pancreas and/or common duct by removing a densely adherent, posterior, penetrating duodenal ulcer, and a compromise should be effected in some cases. Lahey and Marshall[20] stated that mortality in partial gastrectomy, particularly in duodenal ulcer, was largely related to removal of indurated ulcers from the head of the pancreas. Dunphy and associates[21] recently pointed out that postoperative pancreatitis was more common than is realized, and that in many instances it was related to injury to the pancreas or its blood supply during gastrectomy. Whenever it is advisable to leave the pylorus or portion of the antrum for these reasons, the mucosa should be excised.

DISCUSSION

Re-evaluation of the entire problem of the surgical treatment of peptic ulcer illustrates that the proper selection of patients is the

primary factor governing the satisfactory response to a gastric resection. This small series certainly indicated this to be true. Secondary to this, but still of major importance, the degree of resection exerts influence on the end result. Recent reports[22, 23] have advocated lesser degrees of resection combined with vagotomy. These procedures are still in their infancy but may eventually prove to be procedures of choice. Until such a time, however, it is believed that surgeons in the Air Force should continue with the time-proved procedures if any uniformity of over-all results is to be achieved.

This series indicates that the over-all results in the Air Force Medical Service, so far, are fairly adequate. It is believed, however, that if more rigid selection of cases is employed the results may soon approach those obtained at the better civilian institutions. In military practice the problem of motivation is of much more importance than in civilian practice, and should be thoroughly explored before this type of operation is undertaken. In many cases when motivation is in doubt it might be better to deal with the patient administratively rather than surgically.

SUMMARY

Analysis of a series of 36 patients with symptoms of peptic ulcer showed that indications for operation in 52.8 percent were urgent (massive hemorrhage, gastric ulcer, and obstruction), and in 47.2 percent were questionable (chronic recurrence, repeated hemorrhage, and intractability).

In evaluating the possibility that the combination of proper selection of patients and an adequate surgical procedure might be determining factors in obtaining favorable results from operation, it was found that: (1) a 12-percent differential favored those patients whose indications for operation were urgent, and (2) a 15-percent differential favored those patients who were estimated to have had more than 75 percent of the stomach removed.

We believe that the main surgical considerations in the treatment of these patients in addition to the above factors are the physiologic reduction of gastric acidity and motility (best accomplished by resection of 75 percent of the stomach or more), removal of the ulcer itself if possible, and, if the psychosomatic component is pronounced, a supplemental vagotomy.

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ADDENDUM: Since this article was submitted for publication, a total of 132 cases have been collected which will be reported in a subsequent communication.

Our responsibilities to our juniors are great, and it might be well if we worried more about how much we are doing for them and less about how much they are doing for us.

—JAMES T. PRIESTLEY, M. D.
in *Archives of Surgery,*
p. 139, Aug. 1954

KOREAN VIVAX MALARIA

A Statistical Analysis of 95 Patients

LOUIS A. HALL, *Lieutenant, junior grade (MC) USNR*

IN ONE of their excellent series of studies of human malaria published in 1950, Coatney and associates[1] explained the life pattern of the St. Elizabeth strain of vivax malaria. They used data, compiled from 1942 to 1947, from 195 patients intentionally infected with this strain. One of the most significant results of these studies was discovery of the fact that there was an early invasion of the blood stream during the second week after exposure. Following this, there was a latent period of nine to 10 months, after which a period of repeated relapses occurred, with blood stream invasion. This latency is a good illustration of adaptation for survival, allowing this temperate zone strain of *Plasmodium vivax* to survive the cold winter months and continue its life cycle through the mosquito and man during the next infective season. In Korea, as Kehoe and Chandler[2] have pointed out, this period is from April through October.

A few months later, when a large number of United Nations troops became involved in the Korean conflict, the value of this and other similar work became apparent. Korea is an endemic area for *P. vivax,* temperate zone variety. Consequently, suppression of the initial clinical attacks of this disease was deemed to be important in the maintenance of a healthy fighting force. The suppressive drug chosen for this purpose was chloroquine phosphate, one of the 4-amino-quinoline compounds developed during World War II. This was administered to each man in a dosage of 0.5 gram per week and proved very efficacious in the suppression of the initial attacks.

Unfortunately, the whole problem was not solved as the nine- to 10-month latency period of this disease, before remission into the repeated erythrocytic stages, provided time for the transfer of large numbers of veterans back to this country. With the loss of incentive for continuing prophylactic medication, the suppressive drug was dropped and, concurrently, the malarial attack rate in 1951 began to rise in this country. There was an

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estimated total of 12,000 cases of malaria[3] in Korean veterans in this country during 1951 alone.

A number of papers[2,4-9] reviewed the case histories of veterans who manifested the disease after returning to this country. These reviews, covering from a few to as many as 215 cases, showed that the disease had a fairly characteristic course. The amount of anemia and the differential counts accompanying the illness were about the only points on which authors varied to any great extent. The diagnosis was considered to be fairly easy by one group,[2] whereas Hale and Halpenny[4] were of the opinion that it frequently presented a diagnostic challenge.

TABLE 1. *Patients with Korean vivax malaria at USNH, Oakland*

Year	Number of patients	Number of attacks	Number of patients with recurrent attacks
1951	30	41	8*
1952	25	28	3
1953	40	42	2
Total	95	111	13

*One patient had four recurrent attacks of malaria.

The following review incorporates the histories, findings, treatment, and diagnostic problems encountered in 111 attacks of malaria in 95 patients seen at this hospital over the three-year period from January 1951 to January 1954. In many instances these attacks have been described collectively, but where significant differences arise they have been compared on a yearly basis. In this way the general nature and course of the disease as well as the progress in treatment during the three years can be ascertained, and future problems that may be encountered will become more evident.

PATIENTS' HISTORY

Table 1 shows the number of patients studied, on a yearly basis. The number of recurrences listed were only those seen at this hospital. As no long-term followup was made in these cases, the exact number of recurrences is not known. Eighty-one patients, presenting 86 attacks, were admitted here primarily for malaria; the other 25 attacks occurred either in the 14 patients who were in the hospital for unrelated conditions, or were recurrences in the first group while they were convalescing from the previous attack.

The patients were all men between 17 and 43 years of age. Seventy percent of them were between 19 and 23 years of age. The fact that no Negroes were seen here with the disease is quite significant, considering the ratio of Negro to Caucasian soldiers in the endemic area. However, the Negro race shows an apparent immunity to tertian malaria and very few of the previously reported patients have been members of this race.

TABLE 2. *Time of onset prior to admission*

Days	Number of attacks*
>1	2
1	8
2	13
3	24
4	7
5	6
6	3
7	9
8-14	9
15-21	3
22-28	2

*86 attacks in 81 patients admitted primarily for malaria.

Eighty-two of the patients were marines, seven were veterans, two army personnel, and four sailors. One of the last denied ever being closer to Korea than 2,500 yards offshore, which made his mode of infection rather speculative.

The average period of latency could not be determined in this group because the time of infection was unknown. It is interesting to note, however, that 16 patients had been away from Korea for 11 months or longer. One man had returned 18 months previously, but had had a clinical attack of malaria 16 months before the present admission.

Twelve of the 30 patients seen in 1951 had had one or more previous clinical attacks of "Korean" malaria before being seen at this hospital. In 1952 five patients had suffered previously from this disease, while in 1953 only three of the 40 patients had been stricken previously. The decreasing incidence year

by year was probably due to increasing recognition on the part of the troops of the importance of scrupulously taking their suppressive medication, at least while in the endemic area.

Table 2 indicates the length of time these patients were symptomatic before they were admitted. In those with symptoms for over six days the onset was generally gradual and not accompanied by acute and sudden chills and fever, as is more characteristic of the disease. In many of these patients also, the characteristic exacerbations of symptoms every 48 hours were absent, or at least did not occur until shortly prior to admission. The periodicity of symptoms in this disease in 83 attacks is shown in table 3. As is evident from the table, a significant number of the attacks (35 percent) did not demonstrate the typical pattern of fever, chills, and accompanying symptoms occurring every 48 hours and lasting two to four hours each time. This was a definite factor, as will be discussed later, in causing difficulty in diagnosis. The fact that in 28 attacks the frequency of symptoms was not elicited did not give rise to many problems, because these attacks had been diagnosed as malaria before admission, and a less extensive history was taken than in those instances where the diagnosis was in doubt.

TABLE 3. *Periodicity of symptoms*

Periodicity	Number of attacks*	Percent
Daily	22	26.5
Every other day	54	65.0
Every third day	5	6.0
Every fourth day	1	1.2
Every fifth day	1	1.2

*Recorded in 83 attacks.

The symptoms and complaints were many and varied, and have been tabulated in table 4 in the order of frequency. Shaking chills, followed by a high fever, were present in all attacks except that of one patient who did not have chills. Although not a complaint, all the attacks seen here were accompanied by profuse sweating during the period of fever. The headache in practically all instances was retro-orbital or frontal and generally very severe.

The other symptoms, often the presenting chief complaints, were the cause of many of the mistaken diagnoses. This is reflected in the initial diagnosis for each case of malaria (table 5). In most instances the diagnosis was made by the ship or dispensary physician who referred the patient to this hospital.

TABLE 4. *Symptoms in 111 attacks*

Symptoms	Number of attacks	Percent
Fever	111	100.0
Chills	110	99.1
Headache	61	54.9
Malaise	43	38.8
Vomiting	30	27.0
Aching, generalized	29	26.1
Stiff neck and backache	18	16.2
Nausea	17	15.3
Cough	17	15.3
Anorexia	15	13.5
Abdominal pain	10	9.0
Extremity pain	10	9.0
Sore throat	9	8.1
Dizziness	9	8.1
Dysuria and burning	7	6.3
Photophobia	7	6.3
Eye pain	6	5.4
Costovertebral angle and flank pain	4	3.6
Penile discharge	4	3.6
Urgency	4	3.6
Diarrhea	3	2.7
Cold sweat	3	2.7
Hematuria	1	0.9
Epistaxis	1	0.9
Hoarseness	1	0.9

The monthly attack rate (fig. 1) is quite significant, showing that 79.2 percent of all attacks occurred from May through August of each year. This reflects the nine- to 10-month latency period fairly well when it is remembered that the period of infectivity in Korea is from April through October.

PHYSICAL AND LABORATORY FINDINGS

The physical signs accompanying this disease were few, the dissimilarity between the number of symptoms and signs being

quite characteristic. Forty-eight percent of the attacks were accompanied by no physical findings, while the other 52 percent showed one or more of the signs listed in table 6. Splenomegaly was the most constant physical abnormality, but this was present in only 28 percent of the 111 attacks.

Exact temperature charts were not kept in most instances, but in those recorded the average highest temperature was about 104° F. One patient had a temperature of over 107° F. before sponging brought it down.

TABLE 5. *Initial diagnosis in 111 attacks*

Diagnosis	1951	1952	1953
Malaria, *Plasmodium vivax*	19	7	13
Malaria, type unknown	15	11	8
Fever, origin unknown	1	2	7
Influenza	3	3	3
Poliomyelitis	1	1	2
Primary atypical pneumonia		1	1
Upper respiratory infection			2
Rubeola			2
Bronchopneumonia	1	1	
Pyelonephritis			1
Headache, origin unknown			1
Hemorrhagic pyelitis			1
Medical observation	1		
Nasopharyngitis		1	
Brucellosis		1	
Epidemic pleurodynia			1

The laboratory work done generally included a complete blood count, urinalysis, serologic test, and chest roentgenograms. In the 111 attacks all roentgenograms were reported as negative. Table 7 gives a breakdown, on admission, of the white blood cell counts, differentials, and hemoglobin determinations. Considering 5,000 to 10,000 white blood cells as the normal range, 32.6 percent of the attacks were accompanied by leukopenia, 60 percent by normal white blood cell counts, and 6.5 percent by elevated counts. These studies were done at various stages during the attacks, but even during the height of an exacerbation, the white blood cell count was characteristically normal or low. The differential counts were varied and showed no characteristic pattern. Considering 12 grams per 100 ml. as the lower limit of

the normal range of hemoglobin determinations, 18.7 percent showed significant anemia. Considering 12 to 14 grams per 100 ml. as low normal, 57.5 percent of the cases fell in this classification. Only 23.8 percent of the cases showed definitely normal hemoglobin levels.

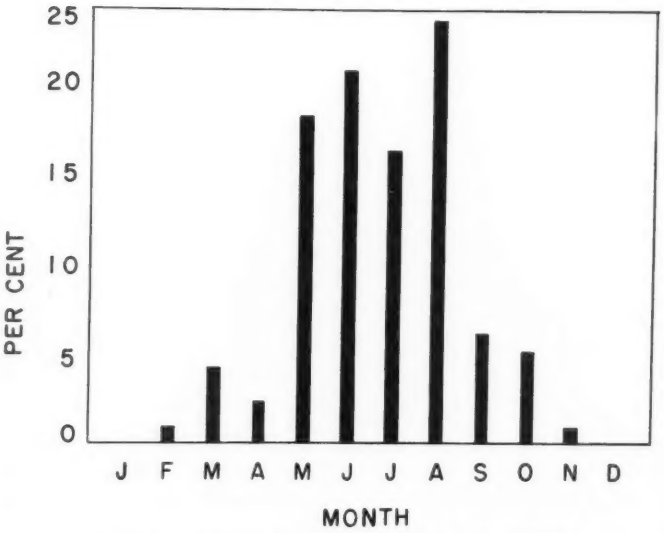

Figure 1. Monthly rate of occurrence in 111 attacks.

The erythrocyte sedimentation rate was measured in only 50 attacks and showed an elevation of over 10 mm. per hour in 70 percent of these.

Urinalyses were recorded in 103 attacks; 25.2 percent showed pyuria with more than five leukocytes per high power dry field. Only two specimens showed hematuria, and six minimal albuminuria.

The number of positive serologic tests varied year by year. In 1951, those patients with 25.6 percent of the attacks had positive serologic tests; this rose to 69.2 percent in 1952, and fell to 5.0 percent in 1953. In all cases it was believed to be a false positive reaction due to the malarial infection. With newer technics, however, such as the cardiolipin test, as proposed by Kent and others,[10] the incidence of false reactions was greatly decreased by 1953. There was no relationship ap-

parent between the time, during the course of the illness, that the blood for the serologic test was drawn and the number of false positive reactions which occurred.

Studies of liver function were done in 13 attacks with seven showing various degrees of damage, especially by the cephalin-cholesterol flocculation method, and six showing no damage.

TABLE 6. *Physical findings in 111 attacks*

Physical findings	Number of attacks*	Percent
Splenomegaly	31	28.0
Hepatomegaly	13	11.7
General adenopathy	11	10.0
Pharyngitis	7	6.3
Herpes simplex	7	6.3
Jaundice	5	4.5
Conjunctivitis	5	4.5
Pneumonic râles	4	3.6
Heart murmur	4	3.6
Costovertebral angle tenderness	4	3.6
Left upper quadrant tenderness	3	2.7
Nuchal rigidity	3	2.7

*All findings limited to 52 percent of the attacks; 48 percent were asymptomatic.

The malarial smears here were all treated with Wright's stain, and were thin smears. The reason for this was that they were generally done by student technicians who, because of limited time, are taught only this method for staining and making peripheral blood smears. As a result (table 8), a large number of attacks were prolonged because smears were read as negative.

It was found, however, that the largest number of trophozoites in the blood stream seemed to appear between the stage of the chill and fever or as the temperature began to rise, and the highest percentage of positive smears was obtained during that time of the attack.

TREATMENT

In 1951, two drugs were mainly used to combat this disease—amodiaquin hydrochloride (camoquin hydrochloride) and chloroquine phosphate, both suppressive agents. The results obtained were excellent with respect to controlling the clinical attack,

TABLE 7. *Peripheral blood findings on admission in all recorded attacks*

White blood cells			Differential count			Hemoglobin		
Count per mm.^{3}	Number of attacks	Percent	Type	Number of attacks	Percent	Grams per 100 ml.	Number of attacks	Percent
2-3,000	2	2.2	Normal	39	41.0	8	0	0.0
3-4,000	11	12.0	Left shift	15	15.8	8-8.9	2	2.5
4-5,000	17	18.4	Lymphocytes above 40 percent	29	30.5	9-9.9	3	3.75
5-6,000	15	16.3	Monocytes above 6 percent	7	7.4	10-10.9	2	2.5
6-7,000	12	13.0	Eosinophils above 4 percent	5	5.2	11-11.9	8	10.0
7-8,000	8	8.7				12-12.9	18	22.5
8-9,000	9	9.8				13-13.9	28	35.0
9-10,000	12	13.0				14-14.9	16	20.0
10-11,000	2	2.2				15-15.9	3	3.75
11-12,000	1	1.1				16	0	0.0
12-13,000	1	1.1						
13-14,000	2	2.2						
Total	92	100.0	Total	95	99.9	Total	80	100.0

for these drugs destroyed the hemoparasites. Due to the fact that the tissue forms were unaffected, however, the recurrence rate as seen here was rather high. In 1951, eight of the 30 patients had a recurrence from two weeks to three months following treatment of the initial attack, and one of these patients had three recurrent attacks at monthly intervals. The dosage of amodiaquin hydrochloride was 0.6 gram given in one day, while that of chloroquine phosphate varied from 0.5 to 4.0 grams administered over a three-day period. Also three patients were treated with quinine and quinacrine hydrochloride (atabrine hydrochloride). If the recurrence occurred after amodiaquin

TABLE 8. *Time in hospital before obtaining positive smear*

Number of days	Number of attacks*
Before admission	17
Day of admission	47
1	12
2	3
3	10
4	4
5	4
6	0
7	1
8	2

*Recorded in 100 attacks.

hydrochloride was given, chloroquine phosphate was used the second time, or vice versa. Long-term followups are not available, but according to previous reports,[11-15] the disease is limited to about three years. Therefore, if each attack is treated, the time for recurrence should be increasingly prolonged.

In 1952, there were only three recurrences in 25 patients. Treatment that year was essentially the same as in 1951, 15 receiving 0.6 gram of amodiaquin hydrochloride, nine receiving from 2.5 to 4.5 grams of chloroquine phosphate in divided doses, and one receiving 8 grams of amodiaquin hydrochloride in all and

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15 mg. of primaquine diphosphate daily for 14 days. The efficaciousness of the last drug was just becoming known about this time. It is probable that the recurrence rate was higher than is apparent in this report, although the subsequent attacks were treated elsewhere.

In 1953, when primaquine diphosphate had become obtainable and had been proved to be curative for malaria,[11-14] a routine mode of treatment was established when the seasonal attacks began again. This consisted of 1 gram of chloroquine phosphate initially, followed in six hours by 0.5 gram, and then 0.5 gram a day for two days. A daily dosage of 15 mg. of primaquine diphosphate was then instituted for 14 days. It also had been shown[11-14] that primaquine diphosphate destroyed the tissue forms but did not alleviate the present clinical attack as rapidly as did the suppressive drugs, especially chloroquine phosphate; thus, the combination of the two was used. Two of the 40 patients seen that year, however, received only chloroquine phosphate for their initial attack, but both suffered recurrences within the month and the established treatment was then used.

Treatment by all of these methods proved dramatic in alleviating the symptoms of the clinical attack, but it is now possible, with the method of treatment used in 1953, regularly to cure a person affected by this disease. Johnson,[16] for example, found a 1.06 percent recurrence after this mode of therapy, as compared to 30.6 percent following the administration of chloroquine phosphate alone.

DISCUSSION

The number of cases of Korean malaria in this country at present should gradually decrease year by year. As already indicated in this article, however, the problems presented by this disease have been rather considerable in the past and some may well continue to be important in the future.

The problem of diagnosis proved to be a major one at this hospital. The diagnostic acumen (fig. 2) progressively became less until in 1953 only 49 percent of the cases seen were initially diagnosed either as malaria or more specifically as *P. vivax* malaria. The course of this disease is fairly typical and yet, due to variance in one factor or another, it was diagnosed as having a cause other than the parasite *P. vivax* in as much as 50 percent of the number of cases each year.

The main factors responsible for mistaken diagnoses were the histories of these patients. The long latency period, the fact that the patients may have been in this country as long as 16 months, was one important point. The similarity of this dis-

ease to other illnesses is evident from the initial diagnoses (table 5), and when certain symptoms more characteristic of diseases other than malaria were of prime importance to the patient, the attention of the examining physician was often diverted from the over-all clinical picture. The fact that in 35

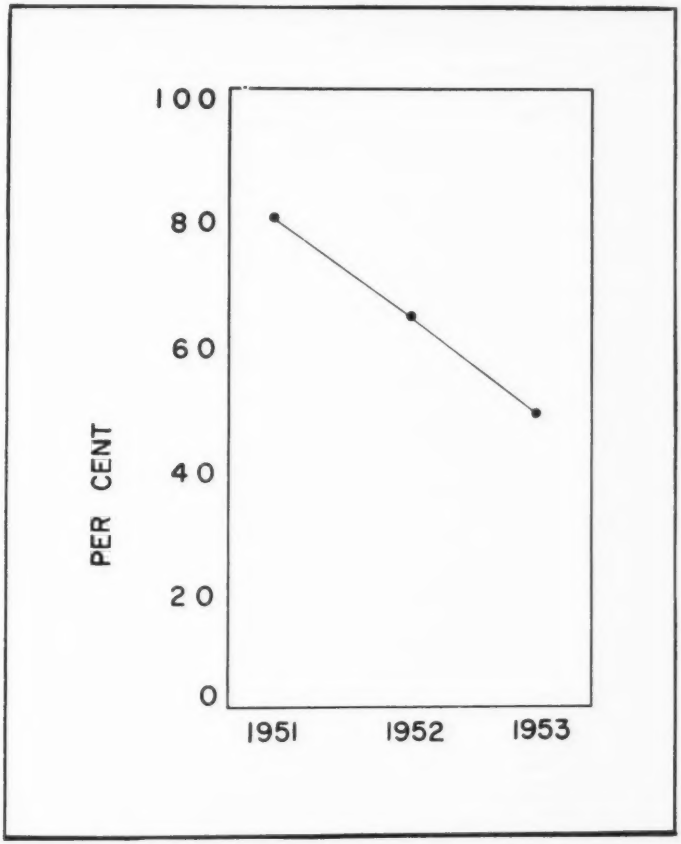

Figure 2. Percent of attacks per year diagnosed as malaria.

percent of the attacks the symptoms did not conform to the textbook description of occurrence every 48 hours, with relative freedom from difficulty between attacks, further contributed to inaccurate diagnoses.

Because the physical findings in this malady are so few, there is no indication, from examination of the patient, of the diagnosis, except for splenomegaly, unless one considers the dis-

similarity in number and severity between the symptoms and signs.

The problem of obtaining positive malarial smears, even during the acute phase, was a large one, and caused delay in treatment in many of the patients. The technic of using thin smears and Wright's stain was not adequate; therefore other methods, such as thick smears with Giemsa's method as proposed by Johnson, should be used.

TABLE 9. *Extra diagnostic procedures performed*

Procedure	Number of attacks
Lumbar puncture	11
Blood culture	39
Urine culture	4
Febrile agglutinins	8
Heterophile agglutinins	11
Rickettsial and influenza agglutinins	2
Stool culture	2
Throat culture	3
Electrocardiogram	1
Protein-bound iodine	1
Liver function studies*	13

*Eight patients had abnormal liver metabolism; all other studies were within normal limits.

Further evidence of difficulty in diagnosing this disease is indicated by the large number of extra diagnostic procedures done in these cases (table 9), all of which were negative except for the studies of liver function as previously noted.

The problem of treatment has now been practically solved, although, of course, search for newer and better drugs will continue. The routine use here of chloroquine phosphate and primaquine diphosphate caused no side reactions in the 40 patients who received these drugs, and indeed, our experience coincides with previous reports and work on the minimal toxicity.[11-15]

CONCLUSIONS

Korean vivax malaria has now become an entity which should become less and less of a problem in this country. The armed

services have instituted a new mode of prophylactic treatment whereby veterans returning from Korea are placed on a 14-day treatment with 15 mg. of primaquine diphosphate daily, which should be sufficient to eliminate the tissue forms these men may be harboring.

A few veterans, however, can still be expected to miss the therapy and develop the clinical symptoms after their return. From findings and diagnostic problems encountered here it seems likely that these patients may present difficult diagnostic problems, especially to a physician who has not had previous experience with this malady.

To solve the problem, the following should at least raise the suspicion of the examining physician. The patient is a white male veteran with previous duty in Korea. He complains of chills, fever, headache, generalized aches, and/or other varied symptoms. These usually occur every other day. Physical findings are probably nonexistent, with the exception that he may have splenomegaly. The white blood cell count is normal or low; the differential count nonspecific. There may or may not be a slight anemia. If malaria is then suspected, it can be confirmed by a thick peripheral blood smear treated by Giemsa's method. At present, the treatment of choice is 1.0 gram of chloroquine phosphate initially, followed by 0.5 gram in six hours and 0.5 gram daily for two days. Primaquine diphosphate is begun also on the first day in a dosage of 15 mg. and carried through for 14 days.

The patient will respond rapidly to treatment and need not be hospitalized. The waste in manpower, as previously caused by this disease, can be eliminated. At this hospital alone, the 95 patients admitted for tertian malaria represented 1,346 days lost to active service.

The experience we have had with this variety of tertian malaria should serve as a warning to physicians in this country in the future. Our progress in methods of travel, with the consequent increased accessibility of other parts of the world, is bringing us closer and closer to diseases not before affecting the inhabitants of the United States. The scope of medical knowledge can no longer be limited to diseases common to our own environment, but must embody more and more those afflictions common to distant lands. Therefore, research concerning the treatment of these diseases may give us a cure for them before they become such major problems, both to the nation as a whole and to such groups as the armed services in particular, as has vivax malaria.

SUMMARY

A review of Korean vivax malaria during the years since the onset of hostilities in that country has been presented, with the histories, physical and laboratory findings, and treatment of the 111 episodes in 95 patients seen at this hospital which have been used statistically to add further weight to the subject.

The problems of diagnosis and treatment encountered have been discussed, and conclusions from the study and from previous reports concerning this disease have been drawn.

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NEW TRENDS IN THE TREATMENT OF TUBERCULOSIS

Analysis of 1,358 Records From a Large Army Hospital

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WITHIN the past five years many changes have occurred in the management of tuberculosis. These changes have developed gradually and subtly, and are largely the result of a growing understanding of specific chemotherapy. The better results obtained with this therapy have made pneumothorax, pneumoperitoneum, and extremely long periods of hospitalization less necessary. Chemotherapy has made it possible for surgeons to operate on lungs infected with tuberculosis with relative safety. Through cumulative experience, surgical technic has been improved, especially in segmental resections. Present treatment regimens, however, are far from crystallized and older opinions are constantly being re-evaluated. For this reason it is believed worth while to review the present-day management of tuberculosis at this hospital through its annual report.

In addition to purely medical problems, there are many administrative problems associated with the treatment of military personnel for tuberculosis. Decisions must be made for military personnel in regard to the advisability of their temporary or permanent retirement from service, the feasibility of their treatment in Army hospitals, the amount of physical activity they are permitted on return to duty, and the potential danger of relapse. We believe that it is important for members of the medical services to be aware of the basis for these decisions and will discuss these specialized aspects of the tuberculosis problem as part of this report.

The preparation of this report has been greatly aided by the use of the punch card described in a previous issue of this *Journal*.[1] This card has facilitated the handling and sorting of the large volume of data so that a careful evaluation could be made.

From Fitzsimons Army Hospital, Denver, Colo. Capt. Mayock is now at Hospital of the University of Pennsylvania, Philadelphia, Pa.

TABLE 1. *Distribution of patients with active pulmonary tuberculosis, by type of patient and extent of infection, 1953*

Extent of infection	Military		Civilian dependent		Veteran		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Minimal	137	26.8	30	19.7	25	8.9	192	20.3
Moderately advanced	273	53.3	78	51.3	117	41.5	468	49.5
Far advanced	102	19.9	44	29.0	140	49.6	286	30.2
Total	512	100	152	100	282	100	946	100

MATERIAL

The patient population of this hospital consists of three different groups: military personnel, dependents of military personnel, and beneficiaries of the Veterans Administration. Somewhat different medical and administrative problems were present in each group and had considerable bearing on the handling of each group. The military patients were in large part young men

TABLE 2. *Distribution of patients discharged from the tuberculosis section, by type of disease, 1952 and 1953*

Diagnosis	1952		1953	
	Number of patients	Percent	Number of patients	Percent
Nontuberculous	239	16.8	207	15.2
Tuberculous	1184	83.2	1151	84.8
Active tuberculosis	(1097)	(77.1)	(1079)	(79.5)
Inactive tuberculosis	(87)	(6.1)	(72)	(5.3)
Total number	1423	100	1358	100
Active tuberculosis				
Pulmonary	946	86.2	946	87.7
Pleural effusion only	115	10.5	97	9.0
Extrapulmonary	36	3.3	36	3.3
Total	1097	100	1079	100
Active pulmonary tuberculosis				
Minimal	175	18.5	192	20.3
Moderately advanced	486	51.4	468	49.5
Far advanced	285	30.1	286	30.2
Total	946	100	946	100

with relatively recent disease, which developed since the chest roentgenograms made at the time of entry into military service. The civilian dependent patients were for the most part young wives of servicemen. They, therefore, represented a good cross section of all stages of tuberculosis.

Through a contract with the Veterans Administration, 240 beds for veterans with tuberculosis were provided at this hospital. These patients were usually older men who had a high incidence of far-advanced cavitary disease (table 1). Frequently their place of residence was hundreds of miles from Denver, and many were recalcitrant patients who had left other hospitals

TABLE 3. *Distribution of patients with nontuberculous disease admitted with an original diagnosis of tuberculosis*

Diagnosis	Year	
	1952	1953
1. Infection and sequela		
a. Fibrosis and/or calcification, pulmonary, cause undetermined	40	36
b. Pulmonary mycotic disease		
Coccidioidomycosis	28	10
Histoplasmosis	16	18
Other fungi	0	2
c. Bronchiectasis	24	16
d. Pneumonia	34	13
e. Pleurisy with effusion, nontuberculous	4	3
f. Bronchitis, chronic	3	3
g. Abscess, lung	3	1
h. Pleuritis, chronic, nontuberculous	3	3
i. Lymphadenopathy, mediastinal	3	0
j. Emphysema, pulmonary	3	3
k. Paragonimiasis	1	0
l. Empyema	0	2
m. Granuloma, cause undetermined	0	11
2. Pneumonoconiosis (silicosis)	3	3
3. Tumors and cysts		
a. Neoplasm, lung	4	10
b. Bronchogenic cyst	1	4
4. Allergic disorders	1	1
5. Congenital anomalies and structural changes		
a. Achalasia, esophagus	1	0
b. Pneumothorax, spontaneous	3	2
6. Trauma		
a. Hematoma, lung	5	1
b. Fibrosis, pleura	1	1
c. Fractured ribs with traumatic pneumonitis	0	1
7. Foreign bodies; aspiration		
a. Lipoid pneumonia	1	1
b. Foreign body retained, left lower lobe bronchus	1	0
8. Blood, vascular and circulatory disorders		
a. Embolism, pulmonary, with infarction	4	0
b. Vascular anomaly, arteries, right upper lobe	1	0
c. Hemoptysis, cause undetermined	2	2
9. Disease, unknown cause		
a. Sarcoidosis	1	5
b. Xanthomatosis	0	1
10. Artefacts, extrinsic shadows	0	0
11. Combined lesions		
a. Inactive tuberculosis with other pulmonary disease	7	0
b. Inactive tuberculosis with extrapulmonary nontuberculous disease	4	7
12. Unclassified and other lesions		
a. Observation, medical, pulmonary disease, none found	31	20
b. No pulmonary disease but extrapulmonary disease	6	15
c. Undiagnosed lesions	0	12
Total	239	207

against medical advice. Their management was very difficult because of the severity of their disease and behavior.

The different results obtained in these groups of patients will be shown in this report. The results obtained in 1953 will be compared with those reported for 1952. All of the terms pertaining to tuberculosis used in this report are in strict accord with the definitions used by the National Tuberculosis Association (NTA) Standards. Such terms include: active, arrested, inactive, "good chronic."[2,3]

RESULTS

During 1953, 1,358 patients were discharged from the tuberculosis service of this hospital (table 2). All of these patients were suspected of having tuberculosis, because patients in whom tuberculosis was not the diagnosis on admission were sent directly to the nontuberculous chest disease section. Of these 1,358 patients, 207 or 15 percent were found not to have tuberculosis. As shown in table 3, the incidence and type of nontuberculous diseases were similar in 1952 and 1953.

As shown in table 2, 72 patients (5.3 percent) were discharged in 1953 as having inactive tuberculosis on admission. The remaining 1,079 patients (79.5 percent) were considered to have active disease. Of the patients with active tuberculosis, 87.7 percent had pulmonary disease; nine percent had pleural effusion alone; and 3.3 percent had extrapulmonary tuberculosis. Of the patients with active pulmonary tuberculosis, 20.3 percent had minimal disease on admission; 49.5 percent, moderately advanced; and 30.2 percent, far advanced. These percentages closely parallel the 1952 figures.

Table 4 shows the final disposition of the patients with pulmonary tuberculosis.

Military Patients. With few exceptions the military patients shown in the "other" category were transferred to Veterans Administration hospitals before completion of treatment. "Irregular" discharges (defined as the un-co-operative patients who either left against advice or were discharged for failure to follow treatment) were very low (1.3 percent) due to Army disciplinary powers over service personnel. Because these persons were AWOL, their eventual return was almost certain. When military patients were released to the Veterans Administration without the restraint of military discipline, irregular discharge rates in several institutions were alarmingly high (50 percent).[4,5] The irregular discharge rate for veteran patients other than military transfers was 15 percent in one of these hospitals.[4] The small number of deaths was due in part to the fact that most of the patients had early disease.

Veteran Patients. Two factors were noteworthy here: (1) a high irregular discharge rate (43.5 percent) and (2) the comparatively high mortality. There was some improvement in irregular discharges over 1952. A minor reason for this improvement may have been the patient's realization that more effective therapy than prolonged bed rest was available. The higher death rate was not unexpected in this older group which includes many patients with advanced, chronic pulmonary disease.

Dependent Patients. This group was most representative of the average civilian sanatorium. Their death rate was low. Irregular discharges were relatively few, reflecting the more cooperative attitude of woman patients.

TREATMENT

Hospitalization. We still believe that the treatment of a patient with tuberculosis is best accomplished in a hospital or sanatorium. Initial hospitalization is almost always necessary for proper medical evaluation and bacteriologic study. In addition, the danger to others by permitting the patient with positive sputum to remain at home makes hospitalization early in the disease extremely important. This is the general belief throughout the country where adequate facilities are available. However, the length of hospitalization has gradually decreased. At this hospital the average patient with minimal disease treated to the inactive stage is now hospitalized from 11 to 15 months; with moderately advanced disease, from 12 to 18 months; and with far-advanced disease, at least 15 months. The major discharge criterion is inactive disease, which means cavity closure, negative sputum, and roentgenogram stability for six months. Outpatient treatment is recommended only to complete drug therapy after the disease has become inactive or reached the "good chronic" stage.

Bed Rest. Strict bed rest is employed only for patients with symptoms or those not responding to therapy. Following this period (usually from two to three months), modified bed rest is employed with gradually increasing activity until discharge.

Specific Therapy. Specific treatment has been analyzed in tables 5 through 8. It must be borne in mind that the treatment here presented represents for the most part that used in 1951 and 1952, because the patients treated then were discharged in 1953. Changes in therapy which have occurred since 1952 will be discussed later. Table 5 presents the general types of therapy employed in patients discharged as inactive in 1952 and 1953. Only one patient with active tuberculosis was placed on bed rest only, in 1953, because he was hypersensitive to the drugs used.

TABLE 4. *Distribution of patients with active tuberculosis, by type of patient and disposition, 1952 and 1953*

Type of disposition	Type of patient										Total			
	Military				Veteran				Civilian dependent					
	1952		1953		1952		1953		1952		1953		1952		1953	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Discharged with maximum hospital benefit (inactive and good chronic)	383	61.8	335	53.2	99	30.3	111	38.0	83	55.3	105	66.9	565	51.5	551	51.1
Irregular discharges	12	1.9	8	1.3	179	54.7	127	43.5	40	26.7	26	16.6	231	21.1	161	14.9
Deaths	5	.8	1	.1	28	8.6	21	7.2	2	1.3	3	1.9	35	3.1	25	2.3
Other (transfers to other hospitals and administrative discharges)	220	35.5	286	45.4	21	6.4	33	11.3	25	16.7	23	14.6	266	24.3	342	31.7
Total	620		630		327		292		150		157		1097		1079	

TABLE 5. *Distribution of patients with active pulmonary tuberculosis treated to the inactive stage (NTA Standards) by type of treatment and extent of disease, 1952 and 1953*

Type of treatment	Minimal				Moderate				Far advanced				Total			
	1952		1953		1952		1953		1952		1953		1952		1953	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Rest only	5	3.9	1*	.8	0	0	0	0	0	0	0	0	5	1.2	1	.2
Rest and drugs	58	45.3	82	66.2	37	14.7	50	20.7	3	5.8	16	21.6	98	22.7	148	33.7
Rest, drugs, and temporary collapse	41	32.0	22	17.7	159	63.4	100	41.5	31	59.6	41	55.4	231	53.6	163	37.1
Rest, drugs, and surgical intervention	24	18.8	19	15.3	55	21.9	91	37.8	18	34.6	17	23.0	97	22.5	127	29.0
Total	128	100	124	100	251	100	241	100	52	100	74	100	431	100	439	100

*Patient was hypersensitive to drugs used.

Drugs. The drugs usually used were one or two grams of streptomycin (SM) every three days, combined with 300 mg. of isoniazid (INH) daily, or 12 grams of para-aminosalicylic acid (PAS) daily. Two hundred and twenty-five patients were treated with rest and drugs to the inactive stage. This includes 148 patients with pulmonary disease (table 5) and 77 patients with pleural effusion or other forms of tuberculosis. Ten who received drugs up to four months, had reactions severe enough to warrant discontinuance of the drugs. Sixty-three patients received chemotherapy for from four to eight months; 102 patients, for from eight to 12 months; 44 patients, for from 12 to 18 months; and six patients, for 18 months or more. When these patients were treated (1952), drug therapy for from six to eight months was considered adequate. This duration has gradually lengthened and chemotherapy for one year is believed the minimum duration for patients who have responded well (see discussion).

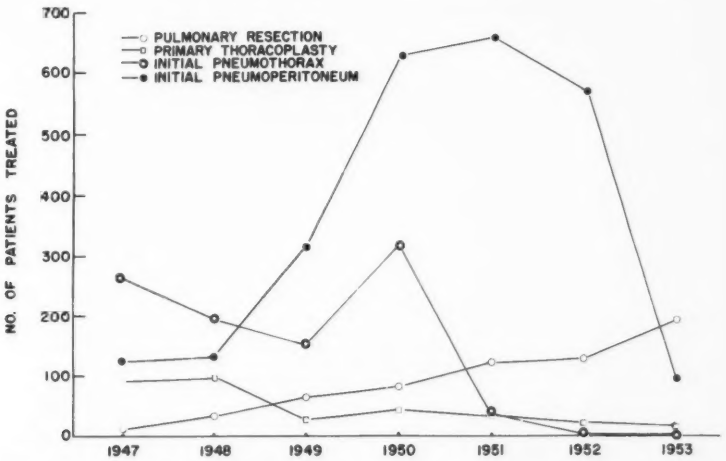

Figure 1. Trends in treatment of patients with pulmonary tuberculosis. About the same number of patients were treated each year.

Temporary Collapse and Surgery. The changing nature of the therapy in tuberculosis has been emphasized above. Pneumothorax was completely abandoned by 1952, partly because of the high rate of complications and partly because good results have been obtained by other less prolonged, more successful methods of therapy. Pneumoperitoneum had a brief period of popularity but it is also on the decline because of the clinical impression that it has contributed little to the better results which are being obtained.

TABLE 6. *Distribution of patients with pulmonary tuberculosis discharged in 1953 who were operated on, by type of patient and operation*

Operation	Military		Veteran		Civilian dependent		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Pneumonectomy	–	–	–	–	4	7.1	4	2.5
Lobectomy with other procedures	15	17.6	6	28.6	18	32.2	39	24.1
Lobectomy	25	29.4	7	33.3	18	32.1	50	30.8
Segmental resection	12	14.1	2	9.5	6	10.7	20	12.3
Wedge resection	23	27.1	2	9.5	2	3.6	27	16.7
Thoracoplasty	5	5.9	3	14.3	8	14.3	16	9.9
Decortication	5	5.9	1	4.8	0	0	6	3.7
Total	85	100	21	100	56	100	162	100

TABLE 7. *Distribution of patients with active tuberculosis by result of treatment, 1952 and 1953*

Result	Veteran				Civilian dependent			
	1952		1953		1952		1953	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Successful (inactive stage)	81	26.5	89	34.4	77	61.6	100	74.6
Unsuccessful	225	83.5	170	65.6	48	38.4	34	25.4
Good chronic	18	5.8	22	8.5	6	4.8	5	3.7
Deaths	28	9.1	21	8.1	2	1.6	3	2.3
Irregular discharges	179	58.6	127	49.0	40	32.0	26	19.4
Total	306	100.0	259	100.0	125	100.0	134	100.0

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TABLE 8. *Distribution of patients with tuberculosis who died, by cause of death, 1952 and 1953*

Cause of death	1952		1953	
	Number	Percent	Number	Percent
Surgical (total)	5	14.3	2	8.0
Operative	0	0	0	0
Early postoperative period	2	5.7	2	8.0
Late postoperative period	3	8.6	0	0
Medical (total)	30	85.7	23	92.0
Nontuberculous causes	8	22.8	6	24.0
Tuberculous	22	62.9	17	68.0
Meningitis	4	11.4	0	0
Progressive or pneumonic tuberculosis	10	28.6	5	20.0
Pulmonary insufficiency	5	14.3	7	28.0
Massive hemorrhage	1	2.9	5	20.0
Silicotuberculosis	2	5.7	0	0
Grand total	35	100	25	100

Primary thoracoplasty still finds a limited place in the treatment of patients with far-advanced cavitary disease but in the main has largely been replaced by resection of the diseased lung tissue. The increase in resectional surgery and the abandonment of temporary collapse procedures is well depicted (fig. 1).

Table 6 illustrates the different operations performed on patients discharged in 1953.

Success of Therapy (table 7). By successful therapy we mean treatment of patients to the inactive stage (NTA Standards), that is, sputum negative, cavities closed, and unchanging roentgenograms for at least six months. These patients should have the best chance of staying well without relapse. Patients discharged as "good chronics" (*i. e.*, with open cavities and/or positive sputum, but roentgenogram stability) were classified as unsuccessful results as were deaths. It was doubtful that deaths from nontuberculous conditions should be so classified; however, all deaths have been analyzed separately (table 8). We believed that irregular discharges should be considered as treatment failures because the relapse rate in these patients presumably will be high. Only those military patients who would probably reach the inactive stage were kept at this hospital. The results in this group, as expected, were excellent and not evaluated here. One hundred and five military patients were returned to active duty in 1953.

Results obtained in the veteran group of patients (a difficult problem from the viewpoint of extent of disease and of patient co-operation) and in the civilian dependent group are compared in table 7. The number of patients discharged as inactive in the veteran group is appallingly low as compared with the civilian dependent group. In both groups the irregular discharges represented a major problem; of 204 "treatment failures," 153 were due to irregular discharges. Of the veteran group one half left the hospital against medical advice as compared with one fifth of the civilian dependents. A hopeful sign in the veteran group is that the results in 1953 were better than those in 1952.

Deaths (table 8). Two operative deaths occurred in 1953, giving a surgical mortality of one percent for 212 procedures. One of the two, a patient whose pulmonary function was borderline for the operation, died of pulmonary insufficiency and the other patient died of repeated massive hemorrhage following segmental resection. The source of bleeding was unexplained at necropsy. A lobectomy was unsuccessful in stopping the hemorrhage.

Of the nonsurgical deaths, eight were due to causes other than tuberculosis. It is noteworthy that in 1953 there were no deaths from tuberculous meningitis. There was a decrease in

deaths from progressive or pneumonic tuberculosis. Some patients at death had only recently started treatment or had drug-resistant organisms. Twelve of the 17 died due to pulmonary insufficiency and cor pulmonale or massive hemorrhage. They represented for the most part the end stages of tuberculosis with cavitary and fibrotic disease, but with very little disease activity. In these patients the complications of tuberculosis rather than progressive disease was the main cause of death.

DISCUSSION

As shown by the data presented, the basis of the present-day therapy for tuberculosis consists of rest, chemotherapy, and excisional surgery. At present, strict bed rest is usually maintained (from two to three months) until the acute exudative phase has cleared and symptoms have largely disappeared. Modified bed rest is then continued until an inactive state is reached.

At present chemotherapy (streptomycin-isoniazid, streptomycin-para-aminosalicylic acid, isoniazid-para-aminosalicylic acid) is begun as soon as diagnostic studies are completed and is given throughout the entire hospitalization for a total of at least 12 months. The average duration of chemotherapy is now nearer 18 months for all patients; many patients with far-advanced disease and all "good chronics" are continued indefinitely on drugs.

Resection is considered after adequate drug therapy (usually from six to eight months) on the basis of the following indications: persistent cavitary disease, continued positive sputum, and significant caseous residuals. During chemotherapy, concentrated sputum smears in addition to cultures are necessary to detect positive bacteriology because of the inhibitory effects of the drugs used on culture growth. All indications are, of course, relative and depend on the disease picture as a whole.

We believe that the immediate over-all results of therapy are very encouraging with the present method of management. Because most patients are on drug therapy until discharge, however, relapse is not to be anticipated until a considerable time after discharge.

It is gratifying to note the excellent results obtained in treatment of the military personnel and their dependents. This probably reflects the co-operation obtainable from these two groups, in the first instance by military discipline and in the second, as a result of their understanding of tuberculosis problems. The consistently poor results obtained in un-co-operative patients in all groups appears to us to be an added argument for more stringent compulsory confinement laws with adequate enforcement as one of the keystones of tuberculosis control.

Irregular discharges have decreased during the past year. This probably represents patient recognition of the advantages of medical treatment and the dangers of not accepting or discontinuing treatment. To patients as well as physicians, improvement is much more dramatic with chemotherapy and bed rest than with bed rest alone. The veteran patients continue to be a serious problem.

Disposition of Military Patients. Because of the chronic relapsing nature of tuberculosis, the Army has in the past been reluctant to retain patients with tuberculosis for treatment, but has preferred to transfer such patients to the Veterans Administration. The major factors for this decision was the prolonged loss of service time, the high cost of hospitalization, the tendency to relapse in spite of therapy, and the necessity for reduced physical activity long after hospitalization. For this reason only a few career personnel with critical military occupational specialties were treated in the past and all others were retired from service.

Present-day changes in treatment have now modified some of the former objections to treatment in military service. Hospitalization has been shortened and in the future may be further shortened with chemotherapy continued on an outpatient program. Relapses are now much lower in number, and more arduous physical exercise can be begun earlier than previously. Although the cost of treatment is still high, it must be balanced against the same relative cost in Veterans Administration hospitals. One major advantage of treatment in military service is the fact that disciplinary power is available when necessary to ensure completion of such treatment. Outside of the armed services the results of this lack are demonstrated by the high irregular discharge rate of those patients retired to the Veterans Administration.[4,5] The patients who leave the hospital with active disease are financial liabilities to the country as a whole. The added cost of future rehospitalization and pensions for these persons will be very high.

The present policy is to temporarily retire all noncareer, short-term (two-year draftee) and nonessential military personnel to the Veterans Administration as soon as a definite diagnosis of tuberculosis is established. Career personnel with disease so severe that a return to duty is not to be expected within 18 months are similarly retired. Patients who had disease present before entry into service which was not aggravated by service are separated from the service with the disease recorded as "line-of-duty no." The great majority of retirements are on a temporary basis and such persons are re-evaluated for active duty in from 12 to 18 months following discharge. If the disease remains in-

active, a return to duty is then recommended. Repeated evaluations are performed. Permanent retirement is granted only to hopelessly diseased persons with little chance for recovery.

SUMMARY

An analysis of the patients discharged from the tuberculosis service of this hospital in 1953 indicates that due to advances in therapy, career members of the armed services who have active pulmonary tuberculosis have better chances than ever for return to full military duty. One hundred and five such patients were returned to duty in 1953.

Two hundred and seven of 1,358 patients (15.2 percent) admitted for possible tuberculosis were found not to have tuberculosis. Seventy-two patients (5.3 percent) were considered to have inactive tuberculosis on admission. Of 1,079 patients with active tuberculosis, 87.7 percent had pulmonary involvement, nine percent had pleural effusion only, and 3.3 percent had extrathoracic disease. Of the patients with active pulmonary tuberculosis, 20.3 percent had minimal disease, 49.5 percent had moderately advanced disease, and 30.2 percent had far-advanced disease.

Present therapeutic trends include drugs given over a longer period of time, increased use of pulmonary resection, limited use of thoracoplasty, and virtual abandonment of temporary collapse procedures. Irregular discharges of un-co-operative patients represent one of the most serious unsolved problems of tuberculosis. This is especially true of the veteran population. Excellent immediate therapeutic results have been obtained in both military patients and their dependents.

Administrative problems associated with military patients are complex in nature and the rationale for handling these patients is based on the extent of the disease and whether or not the patient is a career soldier.

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CHYLOTHORAX DUE TO SPONTANEOUS RUPTURE OF THE THORACIC DUCT

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CHYLOTHORAX, first described by Longelot[1] in 1663, is a comparatively uncommon condition. About 150 cases have been reported in the literature.[2,3] Of even greater rarity is the true spontaneous rupture of the thoracic duct.

TRAUMATIC CHYLOTHORAX

As the name implies, traumatic chylothorax is produced by injuries such as blows on the chest, penetrating wounds, crushing injuries, and hyperextension of the spine. It has been known to occur in the newborn infant when attempts at resuscitation have been too vigorous,[4] or from hyperextension during delivery.[5] Included in this group also are chylothoraxes due to injuries to the thoracic duct during surgery. Smithwick[6] remarked that he had injured the thoracic duct 15 or 20 times during sympathectomies for hypertension. The thoracic duct is injured quite frequently during excision of lymph nodes and other masses from the left side of the neck.

Many of the chest injuries which could produce a chylothorax result in the death of the patient before the condition can become manifest. This of course is because of the close proximity of the duct to vital structures; however, chylothorax can also occur after relatively trivial trauma. Meade and associates[7] called attention to the elasticity and free mobility of the normal thoracic duct. They believed that in most of these injuries the duct must first be bound down or invaded by some disease process before hyperextension or other slight trauma can produce a chylothorax.

Cases of traumatic chylothorax have been summarized by Meade and associates,[7] Shackelford and Fisher,[8] Lampson,[9] and Baldridge and Lewis.[10]

ATRAUMATIC CHYLOTHORAX

Atraumatic chylothorax is usually due to malignant neoplasms, tuberculosis, filariasis, or thrombosis secondarily affecting the

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thoracic duct. Yater[2] in 1935 found less than 100 cases in the world literature, of which 31 were due to neoplasms such as carcinoma, lymphosarcoma, and Hodgkin's disease. Ten cases were due to tuberculosis, and 13 had other causes (thrombosis of the upper great veins, polyserositis, atherosclerosis of the thoracic duct, filariasis, perforating lymphangitis, and diaphragmatic hernia).

In discussing atraumatic chylothorax it is interesting to note that the obstruction of the duct alone is not enough to produce a chylous effusion. Lee[11] in 1922 ligated the thoracic duct in cats and showed that chylothorax did not develop. In time, collateral lymph channels were formed in these animals. Blalock and associates,[12] on the other hand, succeeded in producing a chylous effusion in cats and dogs by ligation of the superior vena cava. One half of his animals developed a chylothorax and some developed a chylopericardium.

That a tumor mass or inflammatory process does not cause a rupture of the thoracic duct by occlusion alone is substantiated by Yater[2] and Washburn.[13] The former author reported 24 cases of duct obstruction in which only three exhibited a chylous effusion. Washburn had 12 such cases, in which only one developed a chylothorax. Instead, the disease process most likely causes a necrosis or suppuration of the duct wall through which perforation can occur. Because the duct is retropleural, chyle is "bottled up" and ruptures into the pleural cavity some time later. Thus, especially in atraumatic chylothorax, there is usually a latent period before chyle appears in the pleural cavity.

HISTORY OF TREATMENT

Not many years ago all patients with chylothorax were treated conservatively with symptomatic and supportative measures. Because most of these patients died from protein and fat depletion, an attempt was made to infuse aspirated chyle. This was first attempted by Oeken[14] in 1908 with a fatal result; however, Bauersfeld[15] in 1937 successfully returned chyle to a patient intravenously. Little and associates[16] reported a case in which, over a six-month period, 22,485 cc. of chyle was infused to a patient without mishap. But in 1942 a patient treated by Whitcomb and Scoville[17] died unexpectedly during a chylous infusion.

Several theories have been advanced for the cause of death during this procedure. These last authors believed their patient died in anaphylactic shock. It would seem unusual that anyone could exhibit an anaphylactic response to his own secretions. Perhaps foreign protein is responsible for the sensitization. Still again the size of the fat globules may play a part by forming a fat embolism.[18]

In 1903, Deanesly[19] advocated implantation of the severed thoracic duct into a nearby large vein, and succeeded in placing the proximal end of the injured duct into the internal jugular vein in the neck. In 1916, Harrison[20] implanted the cut end of the duct into the external jugular vein.

Prior to 1946, when the first successful ligation of the thoracic duct in the chest was done by Lampson, chylothorax resulted in a mortality rate of over 50 percent. In fact, Cushing[21] remarked that the thoracic duct lay in a surgically forbidden territory. In 1934 Yater said, "Ligation in the chest is almost certainly fatal." As late as 1945 Florer and Ochsner[22] wrote, "Direct surgery to repair the duct has been completely unsuccessful, resulting in 100 percent operative mortality." In 1948 Hodge and Bridges[23] advised the implantation of the duct into the azygos vein for fear simple ligation might produce increased intraductal pressure and rupture. In the past few years, however, ligation of the injured thoracic duct has been performed many times without complication.

Other therapeutic measures have been attempted in this condition but need only be mentioned here. These include pneumothorax, phrenic crush, and instillations of broths or chloroazodin (azochloramid).[9] These procedures supposedly close the leaking duct by pressure.

The management of chylothorax was excellently described by Meade and associates.[7] Protein loss should be replaced by a high protein diet and by intravenous infusions of amino acids, serum albumin, and whole blood. Because of the danger of hepatitis, plasma is usually avoided as a means of protein replacement. Meade reported such a complication.

If repeated aspirations of the chyle are performed, about 50 percent of the patients will recover on that regimen alone. Should the amount of chyle fail to decrease, then closed drainage, with or without suction, may be instituted. If the patient still does not respond favorably, a thoracotomy with ligation of the thoracic duct should be performed. It is unwise to use closed suction for more than two weeks, as the lung then becomes encapsulated, necessitating a decortication.

Danger of infection from repeated aspirations is minimal. Chyle in itself is bacteriostatic, and has never been known to become infected.

CASE REPORT

A 17-year-old youth was admitted to this hospital on 29 August 1951 with a diagnosis of pulmonary edema, cause unknown.

His chief complaints were swelling of both ankles and of the face, shortness of breath, and mild cough. He stated that he had been well until one month prior to admission, when he noticed gradual and progressive swelling of his ankles. Two weeks later his face became edematous. About this same time shortness of breath, particularly on exertion, and a mild, nonproductive cough became manifest. All had become more severe. On the day of admission he noticed scrotal edema for the first time.

His past history revealed that he had been a student, had worked in a grocery store, and then had entered the Navy in February 1951. He had not been out of the continental United States. He smoked less than a package of cigarettes per day and rarely drank. His family history was negative for tuberculosis, diabetes, cardiovascular disease, and carcinoma. He had the usual childhood diseases, including whooping cough. There had been no significant adult illnesses and his only surgical operation was a tonsillectomy. His only injury was a simple fracture of a metacarpal several years earlier. No history of recent trauma could be obtained. He denied venereal infection.

Systemic review revealed that he had gained 10 to 15 pounds in the month preceding admission to this hospital. For two weeks prior to admission he had noticed increased urinary frequency (five times a day) and nocturia (one to three times a night).

Physical examination showed a well-developed and well-nourished young man in no apparent distress. His height was 5 feet 7 inches and weight was 155 pounds. His usual weight had been 140 pounds. Temperature was 99° F.; pulse, 80; respirations, 22; and blood pressure, 118/84. There was mild periorbital edema; otherwise the eyes, ears, nose, throat, and neck were negative. Inspection of the thorax revealed a lag of the left chest on deep inspiration. There was absent tactile fremitus, flatness to percussion, and absent breath sounds below the second interspace of the left chest. The heart and mediastinum were shifted slightly to the right, and heart sounds were distant. The abdomen was somewhat rounded and soft. The liver edge was palpable two fingerbreadths below the costal margin. It was smooth and nontender. The spleen and kidneys were not palpable. There were no abdominal masses, tenderness, or rigidity. There was some dullness to percussion in the flanks with suggestive shifting dullness. Bowel sounds were normal. The genitalia were normal except for slight scrotal edema. Two-plus pitting edema of the ankles was present. Neurologic and rectal examinations were negative. The clinical impression was anasarca and pleural effusion, due probably to nephritis.

Laboratory studies were as follows: Repeat urinalyses were within normal limits. Specific gravities varied from 1.018 to

1.024. Sugar and albumin were negative. Microscopics revealed a few amorphous phosphates but were negative for red and white blood cells and for casts. The Kahn test was negative. The red blood cell count was 4,900,000; hemoglobin, 14 grams per 100 cc.; white blood cell count, 7,800 with 88 segmented neutrophils, 10 lymphocytes, and 2 monocytes. Hematocrit was 44. Sedimentation rates varied from 7 to 23 mm./hr. On the day after admission the total protein was 3.6 grams per 100 cc. Without receiving parenteral proteins, and while on a simple low-salt diet, the protein was reported on 10 September 1951 to be 5.72 grams (albumin, 4 grams; globulin, 1.7 grams). Chloride (as sodium chloride) was 460 mg.; nonprotein nitrogen, 36 mg.; and creatinine, 3.2 mg. per 100 cc. The phenolsulfonphthalein test and electrocardiographic findings were normal.

Roentgenograms of the chest revealed a pleural effusion on the left to the level of the second rib anteriorly.

When laboratory studies failed to substantiate the diagnosis of nephritis, tuberculosis was considered as the possible cause. Skin tests were done with these results: histoplasmin and coccidioidin were negative in dilutions up to 1:100; old tuberculin gave a hypersensitive reaction at 1:100, but was negative in greater dilutions.

On 18 September 1951, a left thoracentesis was performed, and 1,600 cc. of white chyle was aspirated. On 25 September a second thoracentesis yielded 500 cc. more. Treatment at this time was purely symptomatic. During the following week repeat roentgenograms (fig. 1) and blood chemistry studies were done. Respiratory function tests revealed that the vital capacity was 2,065 cc. and the air velocity index was 0.88.

The fluid in the left chest rapidly reformed, necessitating repeat thoracenteses with removal of 2,700 cc. and 2,750 cc. of chyle on respective occasions. The patient was given two units of serum albumin following each of these taps. On 9 October 1951 his total protein was 6.18 (albumin, 4.8 grams; globulin, 1.3 grams).

On 11 October a left thoracotomy was performed. After opening the pleural cavity an estimated 4,000 cc. of chyle was removed by suction from the left hemithorax. The lung was covered with a filmy, fibrinous peel which was wiped away. The mediastinum was opened and the esophagus was mobilized. The thoracic duct was identified lying between the aorta and azygos vein. A transverse tear in the lower third of the duct completely divided it, but there was no evidence whatsoever of neoplastic or inflammatory disease to explain the chylous effusion. A portion of the duct was excised and forwarded to the laboratory, where

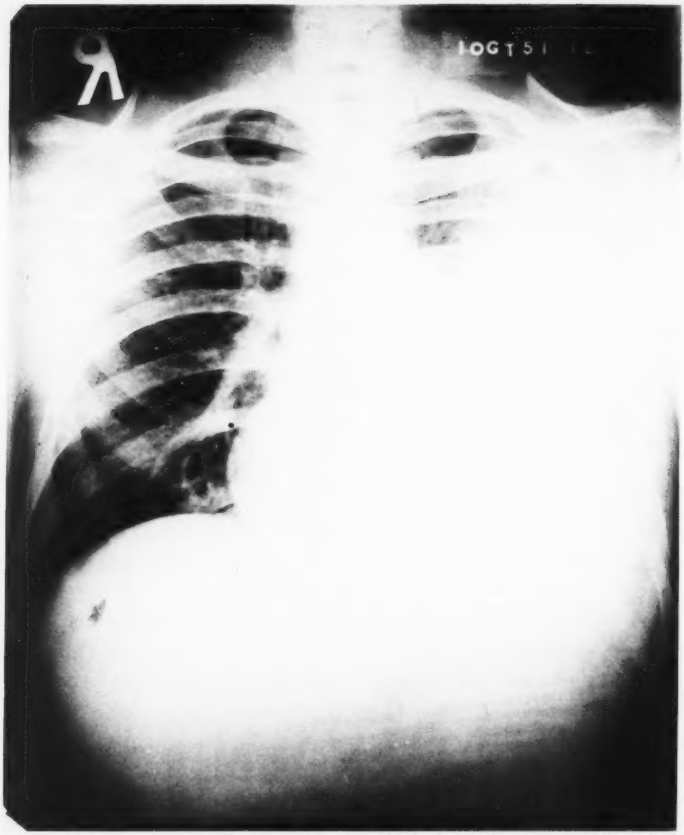

Figure 1. Roentgenogram of chest showing the left chylothorax 10 days before surgical intervention.

microscopic examination revealed a normal thoracic duct. The distal end of the duct was dissected free and ligated. Several proximal branches were isolated. These too were leaking chyle and were ligated. The mediastinum was closed loosely, a No. 24 Foley catheter was inserted into the left chest and connected to underwater suction, and the chest was closed.

The postoperative course was entirely uneventful. The thoracotomy tube was removed on the third day. Roentgenograms showed complete re-expansion of the left lung. There was no evidence of fluid and only minimal postoperative pleuritis. The mediastinum was in the midline. The diaphragm was normal in position and the cardiac shadow was normal.

The patient's convalescence was so remarkable that he went home on convalescent leave 13 days after operation. At the ex-

piration of a 30-day period he was again examined and evaluated. He stated that he was completely asymptomatic while at home, and that he did not find it necessary to restrict his physical activities. A roentgenogram (fig. 2), blood studies, and respiratory function tests were all within normal limits. Physical examination was negative. He was returned to full duty on 7 December 1951.

In February 1952 the patient was readmitted to the hospital because of ankle edema and dyspnea on exertion. Physical examination was negative except for slight ankle edema. Roentgenograms of the chest and respiratory function tests were normal. Laboratory studies, including a complete blood cell count, urinalyses, Kahn, nonprotein nitrogen, total protein, albumin-globulin ratio, and renal function tests, were all within normal

Figure 2. Roentgenogram seven weeks after operation, showing a relatively normal postoperative condition of the chest.

limits. Within five days the patient became completely asymptomatic on bed rest and symptomatic treatment. His ankle edema did not recur even after trials of prolonged standing. He remained symptom-free and was discharged on his thirty-ninth hospital day.

The patient's condition is still being followed. He has been performing his duties at sea without difficulty. Periodic roentgenograms of the chest have been negative and he believes that his physical endurance is above average.

SUMMARY

A patient with spontaneous rupture of the thoracic duct was treated successfully by ligation of the duct. We were unable to find an explanation for the ruptured thoracic duct in this patient. In a recent article Meade[3] presented five cases of "spontaneous" chylothorax; however, he was able to show that four of his patients had recent hyperextension injuries of the back, and "in each of the five cases presented there was evidence that the duct could have become fixed as a result of congenital anomaly, trauma, or infection."[3] Careful interrogation and examination of our patient revealed nothing to suggest a fixed duct, and at operation it was not found to be adherent to neighboring structures.

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THE PHYSICAL EXAMINATION (1863-1954)

The duties which devolve upon the examining surgeon are both delicate in their nature and of difficult performance. Intrusted with the responsibility of deciding some of the most perplexing questions in medical science upon only a few moments' reflection, he cannot approach the discharge of his office without feeling how essentially important to the right understanding of every case are the smallest apparent details of which it is made up. The causes of disease, the catenation of symptoms, their usual and ordinary progress, the results now present and visible, now unseen and latent, which they have produced in the human system—age, temperament, and occupation—all these are data which must be weighed and considered in every instance, before he can correctly form an opinion. When, in addition to the incertitude of natural phenomena, the accidents of *fraud,* by simulation or concealment, enter into the problem, it is not difficult to see that with all the skill possible, and all the readiness of observation employed, cases of deception will at times escape detection.

—JOHN ORDRONAUX, M. D.: *Manual of Instructions for Military Surgeons.* D. Van Nostrand, New York, N. Y., 1863. p. 19.

PREVALENCE OF PINWORM INFESTATION AT A MILITARY INSTALLATION

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INFESTATION with *Enterobius vermicularis* is a universa problem. Stoll[1] calculates that 208.8 million persons in th world are infested with pinworms. He further calculates tha in North America 18 million persons are infested; in Central an South America, 16 million; in Africa, 8.9 million; in Europe, 6 million; in U. S. S. R., 32.5 million; in Asia, 71 million; and i Oceania, 0.4 million. In the United States, the incidence of in fested persons varies considerably in different areas and amon different population groups (table 1).

Because of the world-wide distribution of the armed services many people live or travel outside the United States in area where pinworm infestations may be prevalent (table 2). Becaus many adults and children return from areas of high pinworm fes tation to areas with a relatively low incidence, all medi officers in the armed services, regardless of their station, shou be cognizant of the probability of enterobiasis. Although, i general, pinworm infestations are not a major problem in the Ne England area except in some institutions, we found them to b common among the dependent children at this installation an therefore decided to study its prevalence.

METHOD OF EXAMINATION

All patients studied were seen in the pediatric section of the outpatient clinic of this hospital during the months of February through July 1954. The presenting complaints for which the children were brought to the clinic usually were not related t this study.

The diagnosis of pinworm infestation was made by swabbing the perianal area with cellulose tape as devised by Graham.[2] After the adhesive surface of the tape was touched to the anal orifice, it was affixed to a glass microscope slide. A drop o xylene (xylol) was placed under the adhesive surface of the tape to dissolve extraneous matter, and the slide was examined under a microscope for pinworm eggs. We used only a single swab on

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TABLE 1. *Incidence of enterobiasis in the United States*

TABLE 1. *Incidence of enterobiasis in the United States*

Investigator	Area	Groups examined	Number examined	Incidence (percent)
Cram and Reardon[8]	Washington, D. C.	persons	2,097	41.0
		pre-school age	437	35.0
		school age	1,015	51.0
		adults	348	22.0
Jacobs[9]	San Francisco, Calif.	children	228	31.3
Sawitz and associates[3]	New Orleans, La.	institutionalized white children	136	96.3
Weller and Sorenson[10]	Boston, Mass.	white children	505	19.0
Brown and Sheldon[11]	Charlotte, N. C.	underprivileged white boys	132	32.0
Killingsworth and associates[12]	Port Arthur and Houston, Tex.	adults	1,970	32.0
Headlee[13]	Indianapolis, Ind.	hospitalized children	240	16.3
Heilmann[14]	Roanoke, Va.	adult patients at Veterans Administration Hospital	1,460	11.9
Bumbalo and associates[15]	Buffalo, N. Y.	hospitalized patients	1,145	20.0
Hitchcock[16]	East Lansing, Mich.	children	320	33.8
Cram and associates[17]	West Tampa, Fla.	school children	438	16.0
Doscher[18]	Charleston, S. C.	hospitalized children	Unknown	11.0
		white rural school children	Unknown	14.0
Nolte[19]	Charleston, S. C.	orphan asylum inmates	Unknown	54.0
Mauss[20]	South Dakota	rural school children	315	39.0
Smith and Richardson[21]	Oklahoma	hospitalized children	117	33.0

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TABLE 2. *Incidence of enterobiasis outside the United States*

Investigator	Area	Groups examined	Number examined	Incidence (percent)
Kuitunen-Ekbaum[22]	Toronto, Canada	hospitalized children	300	60.0
		hospitalized adults	56	52.0
Sutliff and Echandi[23]	San Jose, Costa Rica	hospitalized children	92	4.3
Brady[24]	Puerto Rico	children's institution		
		girls	50	30.0
		boys	52	12.0
Cristovao[25]	São Paulo, Brazil	children	309	60.0
Mazotti and Quintanar[26]	Mexico City, Mexico	boys	1,551	48.0
Miller and Einhorn[27]	Ancon, Panama	children	100	95.0
		children	100	53.0
Young[28]	London, England	hospitalized children	119	52.0
Schüffner[29]	Amsterdam, Netherlands	children		100.0
Jirovec and Rozenhnal[30]	Bohemia	children	2,500	80.0
Voplenko[31]	Russia	children	6,552	17.0
Stoll and others[32]	Guam	adults	637	1.0
Chanco and Soriano[33]	Manila, Philippine Islands	school children and adults	490	75.2

most of the patients. Because the swabs were taken throughout the day, many of the children were examined during the afternoon and many of them had been bathed before the examination.

TABLE 3. *Incidence of* Enterobius vermicularis *infection at Westover Air Force Base, Mass.*

Age group (years)	Number of patients examined	Number of positive smears	Incidence (percent)
Under 1	11	1	9.1
1 to 2	43	8	18.6
2 to 3	79	16	20.2
3 to 4	54	14	25.9
4 to 5	54	21	38.8
5 to 6	73	26	35.6
6 to 7	63	20	30.7
7 to 8	55	30	54.5
8 to 9	26	10	38.4
9 to 10	22	6	27.2
10 to 11	18	3	16.6
11 to 12	7	4	57.1
Total	505	159	31.6

RESULTS

In our study of 505 children of both sexes between the ages of six months to 12 years, we found that 31.6 percent had enterobiasis (table 3). Because the incidence of pinworm infestation is relatively rare under the age of one year, we did not examine this age group unless an older sibling was found to be affected. The oldest age group examined was the group of eleven year olds. Although an incidence of 57.1 percent (four of seven children) was found among these patients, we believe that no conclusions can be drawn because of the small number of patients in this group. The years of most frequent occurrence were between four and eight. In this series the peak was in the seven-year-old age group, with 54.5 percent of these children having enterobiasis. It must be stressed that because we used only a single perianal swab for diagnosis of each one of most of our patients, and because many of the swabs were taken in the afternoon after the children had been bathed, the total which we recorded was probably lower and may not have necessarily indicated the actual incidence of *E. vermicularis* infestations. Sawitz and his co-

workers[3] found that the first examination revealed only 70 percent of the cases in their series.

DISCUSSION

Enterobiasis is a cosmopolitan disease, thriving on host populations the world over. It is not confined to the poorer economic groups alone; it is found in all levels of society, and no group has been found to be completely exempt from pinworm infestation.

The only way in which enterobiasis can be adequately diagnosed is by the microscopic examination of a perianal swab for ova. Clinical diagnosis is inaccurate because only 25 percent of the patients have any symptoms. The ideal time to make an examination is in the morning shortly after the patient awakens. At this time the eggs are more apt to be present in the perianal area and will not be lost as a result of bathing, defecation, or scratching.

The female pinworm discharges from 10,000 to 25,000 eggs on the skin near the anus.[4] Each one of the eggs is capable of surviving for a long period under favorable conditions of sufficient moisture and coolness.[5] Eggs, though quite resistant, will succumb to dryness and elevated temperatures.[6]

Enterobiasis should be considered a family disease. Nolan and Reardon[7] studied dust samples from homes of patients with heavy pinworm infestations and found the ova in 91.7 percent of the dust specimens collected. If one member of a family becomes infested, the disease may spread to other members. Living in congested, crowded quarters with limited plumbing facilities further increases the likelihood of transmission.

It is important for all physicians in the armed services to be aware of the pinworm problem. Frequent perianal smears should be performed on all persons living on military installations in order to diagnose and treat all cases of enterobiasis. It is important to instruct the patient as to the nature of the pinworm and the hygienic measures for preventing its recurrence. Active programs for diagnosis should be carried out by medical officers on a world-wide scale. In particular, personnel who are leaving areas with a high infestation rate should be checked to ensure that they are not transporting the pinworm to a new area. The rate of enterobiasis can be lowered considerably under such a program.

SUMMARY

Enterobiasis is prevalent throughout the world. At this hospital, examination of 505 children between the ages of one to 12

years by means of cellulose tape swabs revealed that 31.6 percent of the children had enterobiasis. All medical officers should be aware of the pinworm problem, and efforts should be made to diagnose the infestation so that treatment and prevention can be carried out.

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THE PRINTED WORD

Modern medicine, or at least modern physiology, may be said to have started with Wiliam Harvey. Quickly there followed Boyle, the chemist; Boerhaave, the great "bedside" teacher, the one first to bring patient and theory together; and his Swiss pupil, Albrech von Haller, whose *Elements of the Physiology of the Human Body* (1759-1766) is still quoted. But now we are in the stream of books, medical books, books on history, books of literary value, some of which we like to read. Undoubtedly many manuscripts and learned treatises dropped to the bottom of the stream, some to be hooked by patient fishermen in years to come, but most to be buried in what is known to geologists as primeval sludge. And most were perhaps no better than the sludge itself. Fortunately today there is still sludge, and not every book published can escape it. Many books and articles written should never have left the quivering pen of inadequately prepared authors, whose knowledge has been meager but whose enthusiasm has been boundless. Indiscriminate writing is surely worse than no writing at all.

—WALTER W. BOYD, M. D.
in *Medical Annals of the District of Columbia,*
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CEREBRAL ATROPHY DUE TO ALCOHOLISM IN YOUNG ADULTS

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IN EVALUATION of military patients with more than one enlistment who gave a history of intermittent or periodic heavy drinking and the gradual accumulation of a record of increasingly serious disciplinary offenses, we became interested in studying the problem of chronic alcoholism and brain damage from the standpoint of a team approach. This article presents findings in seven patients elicited by neurologic, psychiatric, and psychologic technics.

The literature reveals many studies concerned with the pathologic and physiologic effects of alcohol on the central nervous system. In studies on autopsy material, Moore,[1] Umiker,[2] and Alexander[3] found edema, hyperemia, and petechial hemorrhages in patients dying of acute alcoholism. Writing on the findings in chronic alcoholism, Alexander, Lichtenstein,[4] Boyd,[5] and Stevenson[6] described the presence of diffuse, generalized cortical atrophy in the gross specimens. Microscopic findings are present in the cortical or striatal areas of the brain in some cases; and in others the cerebellum, medulla, and midbrain may be involved.[3,6-9] The main features are atrophy and loss of cells, perivascular edema, increase in astrocytes, swelling and fragmentation of myelin, and vascular changes, including petechial hemorrhages.

From a roentgenographic point of view, it is a well-accepted fact that atrophy of the brain when present beyond a certain degree is demonstrable by pneumoencephalography.[10-12] There is a wide range in the individual variations in the normal, making evaluation in marginal cases difficult and necessitating a well-trained and experienced roentgenologist.

In a study relating pneumoencephalographic and electroencephalographic findings, Levin and Greenblatt[13] found that 36 of 67 patients with cortical atrophy and/or ventricular dilatation showed abnormal wave patterns. Twenty-one of the 36 were without a history of convulsions, and of these 17 showed slow-wave

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abnormalities. Hines and associates[14] reported abnormal electroencephalograms in four patients with cortical atrophy, and in three of nine patients with chronic alcoholism. Rubin[15] demonstrated abnormal electroencephalograms in nine patients with schizophrenia in whom cerebral atrophy was found. In two of the nine, delta-wave activity was reported.

Goodman and Gilman[16] stated that alcohol causes an irregularly descending depression of the central nervous system. Depression of respiration does not occur until late in the course of marked alcoholic intoxication. In a study of 34 patients with alcoholic hallucinosis, Greenblatt and co-workers[17] demonstrated that during the active phase of the disease six of 13 patients showed abnormal tracings, whereas, following recovery, only one of 21 asymptomatic patients showed abnormal findings. Davis and associates,[18] in studies of the effects of alcohol upon the electroencephalogram, found that relatively low blood alcohol concentrations resulted in a reduction in energy on the fast side of the frequency spectrum, particularly in the range of 10 to 13 cycles per second. At higher concentrations they found episodes of waves of four to eight cycles per second, with an increase in energy in that band of frequencies. Engel and others[19] demonstrated the same effects with alcohol as well as with barbiturates, anoxia, and hypoglycemia. Wyke[20] and Brazier and Finesinger[21] demonstrated in the electroencephalogram a regional differentiation of response to barbiturate sedation, both as to onset in time and degree of change. In patients receiving larger doses per kilogram of body weight, slow-wave activity of three to four cycles per second replaced the original response of slowing of alpha or of the high voltage 20 to 30 cycles per second activity.

Schwab[22] pointed out that short bursts of delta-wave activity may be associated with a slowing of mental processes so slight that experimental methods are necessary to discover it. Hoch and Kubis[23] found that in organic psychoses mental impairment was usually demonstrable when delta waves were present.

The reports of psychologic studies of chronic alcoholics indicate that the prolonged habitual use of intoxicating beverages results in impairment of intellectual functioning.[24] Wechsler[25] found that the digit-span and digit-symbol subtests indicated major impairment. Impaired intellectual functioning was found before there was any clinical evidence of brain pathology. A positive relationship between the intensity of the impairment and chronicity of the alcoholism was indicated. Klebanoff and others[26] in a recent survey of the literature pertaining to the psychologic consequences of brain lesions and ablations, state that results of certain Wechsler-Bellevue subtests appear to be particularly affected by brain injury. The digit-symbol and digit-

span subtests are among these. Morrow and Mark[27,28] in their studies on organic brain pathology also found impairment could be revealed by the digit-span and digit-symbol subtests.

THE STUDY AND ITS FINDINGS

This study deals with seven enlisted men on active duty, each of whom during their military careers reached one of the top three enlisted pay grades. They ranged from 25 to 38 years of age, with a mean age of 32 years, and had been using alcoholic beverages for from seven to 17 years, with a mean of 11 years. Each man indicated a relatively recent intolerance to intoxicating beverages. With the exception of one patient who was admitted with questionable epilepsy, each was admitted to this hospital because of his inability to perform adequately the duties of his rate. All were admitted to the neuropsychiatric service and subjected to physical, psychiatric, neurologic, and psychologic examinations.

The physical examinations of all patients were within normal limits. Six had normal neurologic findings; the seventh showed slight ataxia as determined by gait, finger-to-finger, and finger-to-nose testing. Psychiatric examination revealed the patients to be oriented as to time, place, and person. There was no evidence of hallucinations or delusions. Sensorium was not grossly disturbed; however, each experienced some difficulty in recall, *i. e.*, such things as anamnestic data and test material. There was no evidence of thinking disturbances. As a group, they were slightly dull with apathetic affect, and showed a slight depression of mood in terms of concern over the cause of their difficulties.

The electroencephalographic patterns of all patients were abnormal. Six records revealed symmetrical slow waves, three to four per second, located in the frontal areas. In addition, three of these revealed the same type of waves in the parieto-occipital areas. The seventh record was considered borderline, consisting of low-voltage alpha waves with occasional bursts of slow waves in the frontal regions.

Pneumoencephalographic findings in six of the seven revealed moderate, diffuse, bilateral cortical atrophy in the parietal region. The atrophy in one of the patients is illustrated in figure 1. Frontal atrophy was found in four of these six patients. The seventh showed mild diffuse generalized atrophy. Three of the seven revealed ventricular enlargement as well. In all cases, the parietal involvement was most marked.

The psychologic study used seven, rather than 11, subtests of the Wechsler-Bellevue Intelligence Scale, Form I. Selection was determined in reference to Wechsler's earlier study[24] and was

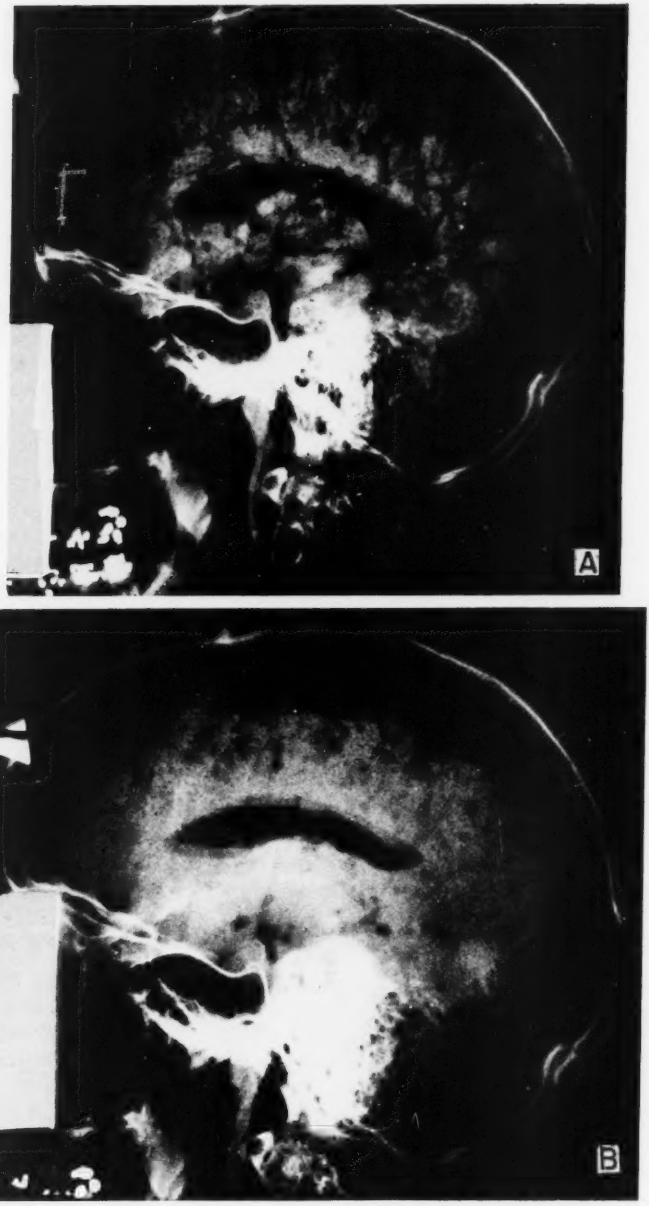

Figure 1. Pneumoencephalogram, right lateral view, revealing moderate, diffuse, cortical atrophy in the parietal region. (A) *Patient in the horizontal position;* (B) *in the vertical position.*

designed to decrease fatigue during testing. The results (table 1) yielded the following mean subtest scores for seven subjects: Information, 10.4; comprehension, 11.1; digit span, 7.4; similarities, 9.6; vocabulary, 11.4; block design, 9.3; and digit symbol, 7.7. The mean of these scores is 9.6 and one standard deviation is equal to 1.4. The subtest scores that differed significantly from the mean and hence revealed a relative degree of impairment were digit span (7.4) and digit symbol (7.7). According to Wechsler[29] the former is related to a disturbance of memory span and may be associated with attention defects and lack of ability in maintaining concentrated effort. The latter score may be the result of decreased motor co-ordination or difficulty in concentration. To state the exact nature of the apparent psychologic deficiency is beyond the scope of this small study. Six of the records were consistent and revealed the above deficiencies. The seventh indicated no impairment on psychologic examination. The electroencephalogram of this patient was noted above as being borderline.

DISCUSSION

A review of the histories of the seven patients failed to reveal any evidence of congenital abnormality, significant trauma, infection such as encephalitis, or exposure to toxic agents such as carbon monoxide. The age group ruled out such conditions as Alzheimer's sclerosis or senile changes. There was no evidence of arteriosclerosis and no clinical signs of Pick's disease; the ages of the patients tended to rule out such conditions anyway. The only common denominator in these cases was the history of excessive intake of intoxicating beverages over a period of many years.

Vogt and Vogt[30] brought out the theory of pathoclisis based on the concept of so-called topistic units. They believed that topistic units may be said to be structurally, functionally, and developmentally characteristic parts of the brain, as for example the various nuclei, layers, or areas of the cerebral cortex. Diseases confined in their distribution to such units are termed topistic, and the tendency of the topistic units to be affected selectively is referred to as pathoclisis. The central idea in the theory is that the smaller or greater structural differences which are to be found within the central nervous system are determined by and reflect functional differences. Differences in cellular function are considered to be responsible for differences in the cells' susceptibility to various noxious agents, many of which are unknown.

The available evidence supports the inference that during acute alcoholic intoxication there is edema which leads to hypoxia; also, intoxication produces direct toxic changes in the

TABLE 1. *Weighted subtest scores on the Wechsler-Bellevue intelligence scale, form 1, in seven patients*

Case number	Age	Subtests						
		Information	Comprehension	Digits	Similarities	Vocabulary	Blocks	Digit symbol
1	30	11	12	6	11	12	12	10
2	30	8	10	6	8	8	8	6
3	25	14	12	10	10	13	7	8
4	32	7	5	4	5	7	7	4
5	35	13	12	7	11	14	11	6
6	37	10	16	13	11	12	12	11
7	38	10	11	6	11	14	8	9
Mean	32.4	10.4	11.1	7.4	9.6	11.4	9.3	7.7

cells of the cortex with interference in the respiratory and metabolic processes. These changes are largely reversible, but some damage is permanent and leads to a loss of cells and nerve fibers, primarily in parietal and frontal regions. In our patients (who are all military personnel), the episodes of intoxication must have occurred periodically. Because all of the men had been on active duty for many years, adequate performance of their duty necessarily involved abstinence from alcoholic beverages for prolonged periods of time. The effects of the periodic acute alcoholic intoxications led to gradual loss of cells with each intoxication. A point was finally reached at which such a cumulative loss of cells resulted in certain findings. Clinically, these patients began to show intolerance to alcohol (subjective feelings of intoxication being elicited by increasingly smaller amounts), and their consequent displays of disturbed judgment involved them in administrative difficulties. Tests such as the electroencephalogram and psychometrics revealed abnormal patterns, and the pneumoencephalogram revealed evidence of atrophy.

It is generally accepted that chronic alcoholics as a group are difficult to handle under any regimen of psychotherapy. We believe that atrophy such as we have demonstrated may be a relevant factor.

SUMMARY

Seven enlisted men with an average age of 32 years and a history of excessive intake of alcoholic beverages over a mean period of 11 years showed no gross pathologic findings on clinical, neurologic, or psychiatric examination. Nevertheless, the digit-span and digit-symbol subtests of the Wechsler-Bellevue intelligence scale revealed significant impairment. Electroencephalograms disclosed abnormal findings consisting of bilateral, high-amplitude, slow waves (three to four per second) in the frontal regions and in some of the parieto-occipital areas as well. Diffuse cortical and subcortical atrophy, particularly in the parietal region, was found on pneumoencephalography.

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HEARING AND INDUSTRIAL NOISE

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INDUSTRY throughout the nation is rapidly recognizing noise as a major health problem. Increased emphasis is being placed on the protection of exposed workers and on the control of this hazard. In spite of extensive noise-abatement programs, many industries are still faced with compensation claims. The Navy probably has more than its share of excessive noise-level areas in connection with its activities.

Early in 1952 a program was inaugurated at this air station designed to conserve the hearing of personnel and to protect the Government from false claims. From its inception this program has consisted of three major phases, each of which will be discussed briefly.

SCIENTIFIC EVALUATION OF THE HAZARD

At the beginning of the program, over-all noise-level intensities were determined and, if sufficiently high to warrant, octave-band frequency analyses were made, the data being plotted on graphs in the usual manner. Based on data published in the literature,[1-7] danger levels in the different frequency bands had been arbitrarily established pending more definite agreement by authorities on the subject. It is generally accepted that the human ear is more susceptible to noises in a frequency band of 2,300 - 4,800 cycles per second. In this band we considered noises in excess of 85 decibels as being potentially dangerous. In a band of 20 - 75 cycles per second, the value increased to 105 decibels. It was evident that over-all intensity levels alone were of little value in determining potentially dangerous areas.

Frequency data were used as a basis for making recommendations for the control of noise at its source when indicated, and when the operation producing the noise was of such nature that mechanical means can be applied. In some instances excellent attentuation was obtained by surrounding the noise producer with an enclosure constructed from sound-absorbing materials.

PERSONAL PROTECTIVE EQUIPMENT

Many noises cannot be controlled at their source and the control of many others is not feasible. Some of the more important

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sources in this group are aircraft engines operating at high revolutions per minute on the field, sandblasting, steam cleaning, metal spraying, the heating of aircraft cylinders with large propane torches, and the drying of parts with high-pressure air streams. Therefore, it became necessary to furnish protective equipment. Personnel exposed to excessive noise intensities reported to the dispensary for an examination of their ear canals. At the time of the visit they were fitted with ear defenders, and all personnel except sand blasters, who must wear abrasive masks, were fitted with protective helmets. The helmet used was an obsolete nylon aviator's helmet equipped with a protective ear covering—a chamois earphone cushion, shaped like a doughnut. The hole in the chamois was first covered with an additional piece of chamois, after which a dense sponge rubber plug was fitted and glued into the opening in the molded, semirigid rubber earphone retainer.

AUDIOMETRY

Suitable Testing Chamber. At the beginning of the program audiograms were taken in the dispensary located in the industrial area. The noise level, which varied almost constantly, ranged from 55 to 65 decibels, with low frequencies predominating. Most persons showed some hearing loss over the entire frequency. Loss in lower frequencies minimized the characteristic drop that occurs at 4,000 cycles per second when diminished hearing has been experienced as a result of extended exposure. It became evident immediately that a more suitable location would have to be found if reliable audiograms were to be obtained.

Persons thoroughly familiar with the station prepared a list of locations they considered quiet. One by one these locations were eliminated. Information that a walk-in cold storage room installed in a brick building was available prompted its investigation as a possible location. The outer walls of the room were of wood and the inner walls, of metal, the total thickness being six inches. The nature of the insulation was not known. The inside dimensions were 11.5 feet by 6.5 feet by 7.5 feet. After a rubber mat was placed on the deck to eliminate noise made by contact with the metal, it was found that the noise level ranged from 26 to 30 decibels. This intensity was not exceeded when many multiengine aircraft were being turned up about one-half mile away, or when planes flew over at a low altitude. The predominant frequencies in the storage room were below 600 cycles per second.

Many authorities have concluded that audiograms taken in noisy environments are of little or no value in determining hearing losses. In some instances a level below 40 decibels has

been recommended, in others a level below 30 decibels.[8-10] A comparison of audiograms (table 1) showing the apparent binaural hearing loss of a few of the persons tested in the two locations confirmed the conclusions reached by others. Binaural losses were calculated by the Fowler-Sabine method[11] which uses only frequencies of from 512 to 4,096 cycles per second.

In the event a person showed a higher percentage loss on audiograms taken in the low intensity surroundings, it was considered that the progressive change had been more than was indicated by comparing the audiograms.

TABLE 1. *Decibel loss and percent of binaural loss at indicated frequencies*
(Sound pressure level in 1952, 55 to 65 decibels; in 1953, 26 to 30 decibels)

Subject	Percent binaural loss		Decibel loss at 512 cps Average left and right		Decibel loss at 4,000 cps Average left and right	
	1952	1953	1952	1953	1952	1953
1	4.0	0.7	20	5	23	18
2	3.5	0.6	20	2	18	13
3	2.7	0.0	25	3	0	3
4	9.8	4.7	28	5	38	38
5	9.1	0.9	20	0	30	20
6	1.9	0.0	20	0	3	0
7	2.9	0.1	13	0	23	13
8	2.8	0.0	20	5	13	8

The loss of hearing caused by long exposure to excessive sound pressure levels is regarded as a slow progressive process. This activity was more interested in this progressive permanent hearing loss than in the temporary loss experienced for relatively short periods following exposure. If the progressive loss was to be evaluated with any degree of accuracy it was mandatory that suitable spaces for conducting audiometric tests be provided.

Table 2 shows the hearing characteristics, at the indicated frequencies and binaural hearing losses, of employees subjected to three types of exposure. No attempt was made to classify the subjects according to age groups or lengths of exposure. The tabulated data was based on the last of a series of audiograms. It can be seen that for any frequency a higher decibel loss was suffered by sandblasters than by those working at other occupations. From such studies a more intelligent program of hearing conservation can be devised.

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TABLE 2. *Number and percent of employees by occupation exhibiting hearing loss at specified frequencies and percent binaural loss*

Occupation, location, and source of noise	Number examined	Decibel loss or percent binaural loss	Frequency-cycles per second																Binaural loss	
			128		256		512		1,024		2,048		4,096		8,192		12,000			
			Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Ground and preflight check, out of doors. Jet and reciprocating engines.	234	0-10	89	38.0	194	82.9	190	81.2	194	82.9	165	70.5	101	43.2	114	48.7	86	36.8	221	94.4
		11-20	119	50.9	34	14.5	37	15.8	33	14.1	48	20.5	52	22.2	46	19.7	59	25.2	10	4.3
		21-30	21	9.0	5	2.1	6	2.6	4	1.7	12	5.1	28	12.0	29	12.4	32	13.7	1	0.4
		31-40	5	2.1	0	0	0	0	2	0.9	5	2.1	26	11.1	15	6.4	24	10.3	0	0
		41-50	0	0	1	0.4	1	0.4	0	0	3	1.3	23	9.8	24	10.3	22	9.4	1	0.4
		51 or more	0	0	0	0	0	0	1	0.4	1	0.4	4	1.7	6	2.6	11	4.7	1	0.4
Test cell control rooms, indoors. Jet and reciprocating engines.	33	0-10	8	24.2	21	63.6	23	69.7	25	75.6	18	54.5	10	30.3	12	36.4	10	30.3	29	87.9
		11-20	17	51.5	8	24.2	5	15.2	5	15.2	9	27.3	12	36.3	12	36.4	7	21.2	2	6.1
		21-30	5	15.2	1	3.0	2	6.1	0	0	4	12.1	2	6.1	3	9.1	5	15.2	1	3.0
		31-40	1	3.0	2	6.1	1	3.0	0	0	1	3.0	6	18.2	2	6.1	5	15.2	1	3.0
		41-50	1	3.0	0	0	2	6.1	3	9.1	1	3.0	2	6.1	3	9.1	3	9.1	0	0
		51 or more	1	3.0	1	3.0	0	0	0	0	0	0	1	3.0	1	3.0	3	9.1	0	0
Sandblasting, inside and outside of cabinets.	17	0-10	3	17.6	7	41.2	11	64.7	10	58.8	6	35.3	4	23.5	3	17.6	4	23.5	10	58.8
		11-20	4	23.5	9	52.8	6	35.3	4	23.5	3	17.6	3	17.6	4	23.5	0	0	5	29.4
		21-30	10	58.8	1	5.9	0	0	3	17.6	4	23.5	2	11.8	6	35.3	5	29.4	0	0
		31-40	0	0	0	0	0	0	0	0	2	11.8	4	23.5	1	5.9	4	23.5	2	11.8
		41-50	0	0	0	0	0	0	0	0	2	11.8	2	11.8	1	5.9	1	5.9	0	0
		51 or more	0	0	0	0	0	0	0	0	0	0	2	11.8	2	11.8	3	17.6	0	0

Testing Procedure. After examination of the ear canals by a medical officer, employees exposed to dangerous noise intensities were evaluated for hearing level by means of a pure-tone audiometer, the examination being repeated periodically. Unfortunately, pre-exposure audiograms had not been taken on these employees, some of whom have been working in noisy areas for many years.

At the beginning of the program a policy was established which requires pre-exposure audiograms on all employees who are to be assigned to danger areas. In addition, each employee was supplied with ear defenders and a helmet. It was recommended that these employees have additional audiograms after six months' exposure. If it was determined that a hearing loss, especially in a range of 4,000 cycles per second, had been experienced, another audiogram was obtained on the following Monday morning to determine if there had been recovery during the two days' absence from the noise. If the loss persisted, it had to be considered that adequate protection had not been used or that the person was a poor risk for the environment. The latter had to be considered because wide individual susceptibility is generally recognized.

Audiograms were never taken on anyone who had been exposed to noise on the day of the test. In conducting periodic audiograms on large groups, five to eight were taken during the first hour of the working day.

Hearing losses are experienced from causes other than noise, and hearing capacity usually diminishes with increased age. Before any conclusion can be reached it is necessary that adequate histories be taken by qualified medical personnel and considered along with the audiograms.

SUMMARY

This article presents the experiences encountered in a hearing conservation program at a naval air station. A suitable audiometric testing chamber was set up and a comparison was made of binaural decibel loss in two different sound environments. The necessity of considering the environment in the testing of hearing is confirmed. The number of persons suffering hearing loss at various frequencies was found to vary with their occupation and proximity to the sources of noise. Forty-one percent of a small group of sandblasters, for example, had a binaural loss of more than 10 percent.

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"THE CAPTAIN OF THE MEN OF DEATH"

With the wide use of antibiotics the fulminating infections of the past are becoming infrequent. Indeed, as opposed to a few years ago, we hardly ever see a case of lobar pneumonia in our large autopsy service. This disappearance of infectious disease, and particularly of pneumonia as a main cause of death, should not lead us to infer that pneumonia and other infections are not still grave problems. The lives of most elderly people are terminated by infections, especially pneumonia, which complicate those diseases . . . pertaining to the older age groups. The pathologist at the autopsy table is too frequently concerned with the basic disease which the patient has, and not sufficiently concerned with the terminating illness. It should be realized that many patients with cardiovascular disease, diabetes mellitus, or bronchiectasis could have lived months or years longer if it had not been for their terminating infection which often was a pneumonia. Osler some forty-odd years ago characterized lobar pneumonia as "the Captain of the Men of Death." Although the antibiotics have conquered lobar pneumonia, I should still select pneumonia, as we know it today, as "the Captain of the Men of Death" since it is still the terminal event in many lives.

—DOUGLAS H. SPRUNT, M. D.
in *Southern Medical Journal,*
p. 484, May 1954

PREVENTIVE MEDICINE IN THE ARMED SERVICES

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IT is my pleasure to attend the opening of this course covering subjects and purposes of high importance. This is my first platform appearance since being reassigned to Washington as Surgeon General of the Air Force, and I can think of no more fitting occasion than this one where we are initiating better understanding in the multiple fields of preventive medicine.

No phase of medical effort, whether it be in military or civilian medicine, contributes more to the stability and integrity of our profession's responsibility to humanity than does preventive medicine. This is particularly true in military medicine because our nation's security and economy are so dependent on the physical and mental efficiency of our limited military manpower. Each of our armed services is being called on to provide more effective defense with fewer available men. Fewer men must do more things, man more guns and ships, fly more planes, produce and maintain more materiel and complicated instruments of warfare. With 3,000,000 men in our military forces, a reduction of five points in the medical noneffective rate would save sufficient military manpower to man one war-strength, fully supported infantry division; about five medium bombardment wings; or the manpower equivalent of naval fire power. Translated into terms of national economy and applied to military medicine, such a reduction in noneffective rates would save enough money in one year to build and equip 30 beautiful 300-bed hospitals. Additional savings from such a noneffective rate reduction would include costs incident to the care of the sick—disability payments, recruiting and training costs for replacements, and personal losses due to illness or injury.

PREVENTION A UNIVERSAL MEASURE

The importance of preventive measures is not peculiar to the medical profession. In fact, I fear that medicine may actually lag behind industry and business in the development of preventive technics. Within these fields much attention is given the

Presented at the opening ceremony of a course in preventive medicine at the National Naval Medical Center, Bethesda, Md., on 16 August 1954.

preventive maintenance of buildings and homes by the use of inspections, paint, frequent repairs, and replacement of defective parts. Such is also true of machinery. We are all prevention-minded insofar as our private automobiles are concerned, and a manufacturer who pays insufficient attention to maintaining his complicated instruments of production will not make a profit. The concept of preventive measures is also affecting the economy of the nation. We observe this in agricultural and industrial production controls, processes designed to prevent a sickness of our national economy which would result in a depression. We daily observe the ideological vultures who are admittedly standing by awaiting the development of symptoms of national weakness and decay.

THE RESPONSIBILITY OF ALL PHYSICIANS

Preventive medicine's importance and requirements are denied only by the uninformed. Yet we see many in the profession leaving such responsibilities solely to military preventive medical officers or to the meager public health personnel of civilian communities. No physician should be absolved of his responsibilities in preventive medicine, and the good physician will practice preventive medicine even within the confines of a limited specialty. There is a tendency to sequester the public health or preventive medicine officer within a military staff and to turn the more knotty problems over to him without rendering him sufficient time and counsel to enable him to solve them. The preventive aspects of prenatal care, well-baby clinics, immunizations, and periodic physical examinations throughout life are well accepted. However, we should go farther than this and inject the concept of preventive medicine into our everyday practice, regardless of our particular specialty. The military medical services have always taken the lead in preventive medicine, and military successes secondary to this science are beyond our ready comprehension. I need not review these many contributions, nor the impact they have made on the picture of world history.

ADDITIONAL ECONOMIC ADVANTAGES

In order to further illustrate the economic advantages of preventive medicine, I believe that we can reliably estimate that each fully developed case of rheumatic fever contracted in the service costs the armed services about $20,000. Each case of tuberculosis or other chronic disabling infectious disease is surely as costly. Consider that one physician working an entire year could prevent even one of these cases from becoming a drain on the public economy and you have an idea of the degree to which preventive medicine pays off. A more dramatic example can be found in the area of airplane accident prevention. If

within the three services we could effect a one-percent reduction of accident costs we would save enough money to pay the yearly salaries and allowances of 370 majors in the Medical Corps.

SCOPE OF PREVENTIVE MEDICINE

We tend to speak of public health and preventive medicine in terms of infectious processes. I believe that we must also include industrial health, accident prevention, and the health and physiologic measures necessary to properly adapt people to their working environment and vice versa. This very course of study you are now entering is an outgrowth of the preventive medicine effort of environmental adaptation in aviation medicine. The security of our nation may very well depend on the success incident to mutually adapting men and machines, or men and weapons, to a satisfactory degree of stability, safety, and efficiency in a bizarre environment characterized by speed, acceleration, vacuum, heat, cold, radiation, blast, zero gravity, and time-stress factors—all of superlative degree. Today's greatest bomber has over 10,000 times the power of the first plane built by the Wright brothers. It will fly a thousand times higher and a hundred times faster than theirs did, and its range of flight, pay-load, and military effectiveness have been infinitely increased. All this in 50 years! My sincere hope is that we in aviation medicine are keeping pace with engineering progress. If I may project a hypothesis, let us consider that within the next 20 years or less we may create and man a machine that will go 10 times higher and 10 times faster than our most spectacular planes of today. Then we will have indeed reached the era of space medicine, and our present concepts of preventive medicine in the air will have to be reviewed accordingly.

If all of us here today were specialized in the fields of preventive medicine, our first responsibility would be to recognize our trust. No one group of medical men or engineers should or can become the legal custodians of man's health or welfare. The responsibility of preventive medicine is with us all. It is a branch of medicine with which all of us, both professional men and laymen, should be ever increasingly familiar. We depend on you who become better informed to help us in our mutual responsibilities to society. I wish you the greatest success in this course. May its value be a real one that you can share after returning to your regularly assigned duties. You are committed to a great trust of medical and national economy.

THE PASSIVE-DEPENDENT VERSUS THE PASSIVE-AGGRESSIVE PERSONALITY

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THE TERMS passive-dependent personality and passive-aggressive personality are relatively new in the psychiatric nomenclature. They are terms in frequent use today, especially in the armed services and in the Veterans Administration; but most descriptions are short summaries such as appear in the *Joint Armed Forces Nomenclature and Method of Recording Psychiatric Conditions*[1] and the *Veterans Administration Technical Bulletin 10-A-78*.[2] These brief characterizations are of little value to the general physician who has not had the experience to form a definite picture of these personality types. To the uninitiated, the term passive-dependent may seem redundant, whereas the term passive-aggressive may seem contradictory. Actually these are very apt terms, and each implies a characteristic clinical appearance and historical development. The character sketches drawn here are composites of features found in varying degree and number among these patients.

Both syndromes belong to what psychiatrists call personality disorders or character disorders. These terms imply a course of development from early childhood to the present time, a logical progression of events from one point to another, so that the current appearance is the result of a characteristic life history. The character disorder, then, has progressed and become fixed in a rigid structure over a period of years, and represents an adaptation of the person to his environment, or a philosophy of life.

THE PASSIVE-DEPENDENT PERSONALITY

The passive-dependent character is a boy in man's clothes. He is the child who never got away from his mother's apron strings. In addition to being emotionally immature, he is frequently immature physically, but this is not always so. Phenomenologically we see this type of person as helpless, indecisive, and clinging to stronger figures—parent substitutes. He characteristically becomes anxiety-ridden when faced with responsibility.

He is almost always extremely close to his parents and emotionally dependent upon them, especially his mother. Having been

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overprotected by a supersolicitous mother, he would not consider making decisions without consulting her—or without consulting his father if he feels the need to mollify his dependency. Leaving home, even for a short period of time, is about the most terrible experience imaginable for him; he never severs his close ties with home. After he is married, if he ever is, and then only to a mother-substitute who is usually several years older than he, he lives in the same town, same street, even the same house as his parents. He brings his marital squabbles home to Mamma's big bosom and embracing arms. If he should inadvertently marry a woman who makes any extensive physical, social, sexual, or economic demands of him, he feels inadequate, occasionally defensive, and unable to cope with the situation. Indeed, at such a time he may feel incapable of coping with life in general; and he characteristically seeks surcease in alcohol. As described by Knight,[3] the typical alcoholic is a passive-dependent character.

When things seem really bad, the passive-dependent is likely to make a suicidal gesture. He may honestly feel at such a time that he wants to die, and he may accidentally even succeed in killing himself. The gesture, however, is typically a bid for sympathy and a return to the state of being taken care of, though it is frequently a reaction of hostility toward a parent or parent-figure by whom he feels rejected. It is as if he were saying, "You'll be sorry when I'm dead and gone."

The life history of the passive-dependent person is typically benign and "happy" unless evidence of separation anxiety is obtained. He is usually a "good" baby and rarely a feeding problem until the time of weaning, which he may resist strongly. He eats well, especially taking a great deal of milk. His general development is fairly normal, and he is described as a "good" or "happy" child. He is very close, physically and emotionally, to his parents, who make a habit of overprotecting him. His early life is characterized by "Don't" and "Oh, my poor—." He may be a behavior problem until he accepts the passive response to "Don't," and comes running to Mommie with every minor physical and psychic bruise.

Once he has accepted this passivity, his character is set for life and his goal is to maintain it. Later on, he may attempt to deny it consciously and go through a period of social rebellion or psychosomatic illness. This is usually determined by social pressure upon him to "grow up" and "be like a man." But when the chips are down he reverts to a passive, frequently weeping, self-centered state in which he feels sorry for himself and wants others to do the same.

His first noticeable period of anxiety may be when he starts school and is separated from his mother for the first time. Extreme forms of the dependency-fostering mother are seen in the one who daily walks Johnny to school, or the one who wishes to make him "independent"—she follows along a block behind. These children do not do well in summer camps if they ever get there. Being victims of "smother love" they become frightened and homesick. They run crying home to Mommie at the slightest threatening gesture from their playmates. In the presence of Mommie, and usually with her implied approval, they usurp the toys of their playmates, but they do not share their own. When they are separated from home long enough, as for example in school, and can find a satisfactory protective parent-substitute who will give all the attention they demand, they get along quite well. After all, their desire is to please the parent-figure—to be a "good boy." They frequently study hard and make good grades in an effort to please. While at home they may be given feminine chores such as washing dishes, dusting, cleaning, even sewing and cooking. They develop feminine identifications and may even become passive homosexuals.

The school career, then, of the passive-dependent person is not remarkable. He is usually "sissified" to some degree and prefers the company of older girls. His work adjustment may be quite satisfactory, especially in the presence of an understanding, sympathetic superior who doesn't object to a little "apple polishing." He works diligently in an effort to please. But as he grows older and more skilled, he is promoted; instead of receiving attention he is expected to give it. Instead of being told what to to, he is expected to give orders and make decisions. With his increased responsibility he becomes helpless, indecisive, and anxious.

It is usually at about this time that he becomes married, if ever at all, to an older girl who reminds him of his mother. She may be dominating and solicitous, yet she also wishes to be treated like a woman. When her husband is reprimanded at work for his inefficiency, she may cuddle him and sympathize with him, but she will probably berate him as well, not only for losing his job but also for his general inadequacy as a man. Usually by this time his father is dead, ill, or financially insecure and the passive-dependent character feels compelled to contribute to the support of his mother. And his wife castigates him for that, too.

This situation may precipitate a mild to severe anxiety state; it may eventuate in a "psychosomatic" illness such as ulcerative colitis, headache, backache, obesity, alcoholism, or the anginal syndrome. If he attempts to improve himself—to become more aggressive—he may be rewarded with a peptic ulcer.

Of course, he may be able to make some kind of adjustment at any of these levels. His marriage, if it lasts, may result in his adjustment as a passive, henpecked Mr. Milquetoast in a constellation of chronic tensions and hostilities. He may return to Mother, even give up his job, and help about the house while getting fat on "Mother's good food." He may obtain the attention he requires by an incapacitating illness. In the extreme form, as he grows older and older he becomes a physical and psychological wreck, progressively more dependent on his wife and children, if any, whom he has brought up to be little passive-dependents, or rebellious delinquents.

THE PASSIVE-AGGRESSIVE CHARACTER

The passive-aggressive character is the man you don't like. You can't like him because he doesn't like you. He has a grudge against society, especially against authority, and he shows it. He shows it in his own passively aggressive way, so that you are aware of it but can't actually put your finger on it. The most important thing for him is to commit an act which demonstrates his hostility, but remains "just within the law."

He seems to be on a perpetual sitdown strike. It is not always necessary that the act be recognized. In the military services this may be expressed as refusal to salute an officer. Other passive-aggressives salute very happily—with the thumb more or less obtrusively touching the nose! This type of character has been humorously typified as the sky-writer who takes his airplane behind a cloud and writes "nuts" all over the sky. He typically expresses his hostility and aggression in such passive ways as stubborness, procrastination, inefficiency, ignoring the social amenities, forgetting names, and showing disrespect in general.

His behavior may be deliberately antagonizing. Given a job to do, he may refuse with a surly remark, then shuffle off and perform it in a procrastinating, inefficient, lackadaisical manner. Reprimanded for his refusal, he points out that he actually did the job; then he feels wronged and persecuted. This serves to confirm and increase his resentment against authority, yet he may remain completely unaware of his own part in the total proceedings. When he is frustrated or cannot get his own way, he may injure himself, make a suicidal gesture, or threaten suicide. This behavior is analogous to the temper tantrum of the two-year-old child. It is as if he were saying, "If you don't do what I want, I'll hurt myself and then you'll be sorry."

It can easily be seen, then, that passive-aggression is an attitude. It is an attitude upon which behavior is based. Any act can be passive-aggressive in nature, even exaggerated efficiency

and respect; and this is one reason why these personalities are not always recognized as such. After all, the goal of these men is not to have their acts pinpointed as aggressive, but to express hostility without its being recognized. Just as neglecting to say "Sir" can express disrespect and hostility, so can a little extra emphasis on the word show the same thing, yet the latter action cannot be criticized. These men will go to any extreme to avoid work; they will actually work harder at avoiding duties than they would have if they had gone ahead and done the job. They will not be at hand when assignments are given out, or they will appear extremely busy (for the moment) doing something else. They will actually hide or perhaps feign illness to avoid work. They make frequent trips to the water cooler or the rest room. Their intent is not merely to avoid work but, more important, to express their hostility toward the authority which forces them to do the work. By the time they reach the age of 17 or 18, however, this intent has lost a great deal of its consciousness and may not be recognizable to the men themselves or to the casual observer. When apprehended and criticized for their disrespect and avoidance of work, their basic sullenness and resentment may show itself in silent contempt, a mumbled half-intelligible epithet, or even in some cases an overtly sneering remark. The sullenness and resentment, on the other hand, may be covered over by protestations of innocence or misunderstanding, but they are rarely accompanied by a promise to do better in the future. These men are the classic "ten percent who never get the word."

The passive-aggressive aspects of character need not always be considered "bad," however; as a matter of fact, these are considered by many to be among the least undesirable of the immature personality reactions. The passive-aggressive person is usually shrewd and can judge a situation fairly accurately and quickly. He is frequently known for his biting, cynical wit and satire. He has to know exactly how far he can go without getting into serious trouble. He has to know something about the personality of the person to whom he wants to show his disrespect. Can he—and should he—refuse an order, or would it be safer and just as effective to be a few minutes late for an appointment? If the latter, should it be two minutes or 20 minutes? This is a trick that many mildly passive-aggressive persons use to demonstrate that a love affair has ended.

The passive-aggressive tendency, as may so many others, may originate in conflict with parents who are typically very strict, harsh, and domineering. They stultify the child's emotional development by destroying his basic trust in them. They cannot tolerate the child's natural expressions of hostility and resentment. Even in infancy and early childhood the child realizes that it is too dangerous to overtly express hostility, resentment, even

fear or tears. His attempts at showing affection are also rebuffed, for the parents are usually hostile to the child. So an ever-widening vicious circle is set up. The child is rebuffed, rejected. He expresses his hostility in passive ways such as refusal of food at mealtime but eating between meals, bedwetting, demanding repeated glasses of water or trips to the toilet after retiring, stammering, and general apparent delay in development. It can be seen from these descriptions that the passive-aggressive act serves as an attention-getting mechanism. A scolding or a spanking is considered much better than no attention at all. Thus his goal becomes to get the most attention at the smallest price.

This child is a feeding problem, toilet-training problem, and behavior problem in general. His acts are annoying to the parents but not actually punishable. Frequently the parents, at the end of their tolerance (which is relatively little), will spank the child "on general principles." And gradually the desire for attention is driven further and further into the unconscious until only the phenomenology of the passive-aggressive character remains apparent.

The passive-aggressive may be a behavior problem in school, transferring to his teachers the attitudes he maintains toward his parents. Whether he learns well or poorly, he is a thorn in his teacher's side. He is frequently late or truant. His lessons are not prepared and his assignments are turned in late. Until he learns how far he can go he may be in frequent fights with the other students. He tries to break the rules of games without being caught, but when he is caught he insists that he did not break a rule or blames it on someone else. As he grows older, symptoms such as bedwetting and stammering may persist, while he becomes a juvenile delinquent and is arrested for acts of vandalism, traffic violations, or "on suspicion."

In the military service or on the job he is considered a "fluff-off" or "gold brick." The hostility he engenders in his superiors by his resentment and passive-aggressive behavior results in his being assigned the more undesirable duties. Then his resentment and feelings of being "picked on" are increased. He takes advantage of minor illnesses to get out of work. Backache, headache, and painful feet are his favorite somatic complaints.

Like those with other personality disorders, he loves neither deeply nor well. His love and married life is characterized by his selfishness, suspiciousness, and jealousy. The girl who can tolerate his behavior is the long-suffering, masochistic type; but frequently her patience wears thin, too, and the marriage ends in divorce. Because the manifestations of this condition are so protean, the characters of the children are also varied. The parents manipulate the children to obtain their support in the

family arguments. The children have no really strong character with whom to identify, and usually become weak-willed, passive, shy, withdrawn, selfish, helpless, and indecisive. On the other hand they may overreact and become hostile, overtly aggressive juvenile delinquents.

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CIGARETTE COUGH VS. LUNG CANCER

The recent great excitement about the role of cigarette smoking in lung cancer has overshadowed all the other ill effects from the use of tobacco. The writer refers particularly to the disturbing chronic cough of the heavy cigarette smoker of long standing. While the cough is not as devastating as cancer, it is nevertheless serious, especially in older people who have smoked a long time. The curious thing about this is that the textbooks in their discussion of tobacco and its toxic effects do not mention the cough, and yet this is practically common knowledge. No greater proof that every layman is aware of it is needed than the famous advertisement of recent years by a leading cigarette manufacturer which was broadcast far and wide: "Not a cough in a carload." . . .

While the writer cannot say definitely that this irritation and resulting cough play a part in cancer of the lung, one can say that there seems to be a certain relationship since it is more prevalent among older people, smokers of long standing. The writer thinks it important to advise people who have developed this kind of cough to abstain from smoking. They will be rewarded comparatively quickly by getting rid of a "nasty" and irritating cough and, perhaps, avoid even more serious trouble.

—MAX H. WEINBERG, M. D.
in *Pennsylvania Medical Journal*,
p. 1000, Oct. 1954

Clinicopathologic Conference

U. S. Naval Hospital, Bethesda, Md.*

PLEURAL EFFUSION

Summary of Clinical History. A 36-year-old Negro woman entered the hospital on 28 May 1954 complaining principally of shortness of breath and pain and tenderness in the left side of the chest of about two years' duration.

She had previously been hospitalized on 31 August 1950 because of "indigestion," some left thoracic pain, shortness of breath, and orthopnea, and was discharged after one month feeling much improved. Several smears, cultures, and guinea pig inoculations from sputum and gastric washings were negative for acid fast bacteria. Until a few weeks previously she had been able to continue to work in a restaurant despite moderate exertional dyspnea and left thoracic discomfort. About two weeks before admission she became very short of breath again and had several bouts of profuse perspiration and slight orthopnea. She was treated at the dispensary for "gas pains" and was also given antibiotics because of abnormal left lung findings, with some relief. On this admission she specifically denied any cough, hemoptysis, or syncope, but had moderate ankle edema on completion of her day's work on two occasions. She had been awakened several times in recent weeks with acute shortness of breath, but had been able to return to sleep without therapy. There was no history of past or present cardiac medication.

The past history revealed that she had always been an active person, with the exception of hospitalization at the age of 18 when hysterectomy and possibly oophorectomy were performed because of pain in the right side of the abdomen and severe menorrhagia unsuccessfully treated medically. About 12 years ago a routine chest roentgenogram taken at a hospital revealed evidence of left lung and left rib-cage abnormalities which were

*Capt. G. B. Tayloe (MC) USN, Commanding Officer. From the Medical Service, Capt. A. Zikmund (MC) USN, Chief.

discussed with her and were followed serially, at six monthly intervals at first and subsequently with yearly roentgenograms. She was told that she did not require hospitalization and no therapy was offered. The exact nature of her thoracic problem was not explained to her.

She has always been aware of asymmetry of the left side of the head and face with proptosis of the left eye. Significant data obtained from her aunt indicates that she experienced her first menstrual period at one *month* of age with regular recurrence of periods at monthly intervals until 18 years of age when hysterectomy was performed as noted above. Medical investigation of this precocity was never solicited.

The family history was essentially noncontributory. One brother died at two years of age from pneumonia. Another brother, now 44 years of age, has diabetes mellitus.

She was married in 1936 at the age of 18 but never experienced pregnancy. Libido appeared to be within the limits of normal.

Her weight had not changed appreciably over the past five years. Eyesight had remained normal. There were no significant headaches. There was occasional mild right knee discomfort without swelling, and a similar rheumatic complaint was present in the left shoulder area. She never observed abnormal skin pigmentation and never suffered fractures or other bony changes except the asymmetry of the skull as already stated. Spontaneous nosebleeds recurred frequently throughout childhood, but none after the age of 20.

Physical Examination. The patient appeared to be slightly dyspneic on mild effort, but fairly comfortable while seated. Blood pressure was 110/80 mm. Hg, pulse was 70 per minute and regular, and temperature was 98.2° F. Her weight was 122 pounds (average 130-135 pounds). There was an asymmetry of the skull with prominence of the left hemicranium chiefly in the frontoparietal area, moderate proptosis of the left eye, and some prominence of the left orbital area. The head appeared globular and large. A consulting ophthalmologist reported normal fundi with the exception of slightly shallower cupping of the left disk as compared with the right, slightly greater resistance of the eye to digital pressure, and normal visual acuity, peripheral fields, and muscle balance. Exophthalmometer measurements (Hertel) revealed 19 mm. in the right eye and 24 mm. in the left eye. The thyroid was small and there was no significant enlargement of lymph nodes in the neck or abnormal prominence of the neck veins. There was slight scoliosis toward the left side. There was a definite inspiratory lag involving the left side. The tra-

chea appeared to be deviated slightly to the left. There was dullness to flatness on percussion over most of the left hemithorax with marked diminution of breath sounds and vocal fremitus. The right hemithorax was normal except for shift of the mediastinum to the right. There was tenderness over the second and third ribs on the left side anteriorly with palpable irregularity in the contour of several ribs. The point of maximum cardiac impulse and the heart tones were best heard to the right of the midline. No murmurs were heard. The liver edge was palpable two fingerbreadths below the right costal margin. The peripheral pulses were normal, and there was no pedal edema. There was normal motion throughout all of the extremities and no clubbing of the fingers. A pelvic examination was nonrevealing. Secondary sex characteristics were within the limits of normal.

Laboratory Studies. The leukocyte count was 5,850 per cu. mm.; differential, neutrophils 60 percent, lymphocytes 28 percent, monocytes 4 percent, eosinophils 8 percent; hemoglobin, 11 grams per 100 ml.; hematocrit 39 percent; blood urea nitrogen 20 mg., uric acid 4.3 mg., serum calcium 9.9 mg., inorganic phosphorus 4.4 mg., all per 100 ml.; alkaline phosphatase, 12.6 Bodansky units; urinalysis, negative; serologic test for syphilis (Kahn), negative; total serum protein, 6.5 grams, albumin 4.2 grams, globulin 2.3 grams, all per 100 ml.; serum chlorides, 95 mEq/L.

A gastrointestinal series revealed displacement of the esophagus to the right and posteriorly by what appeared to be aortic arch and possibly auricular indentation. Excretory urograms failed to reveal evidence of renal or ureteral calculi.

Course in Hospital. Thoracentesis was performed on 23 June 1954 with removal of about 420 cc. of amber-colored fluid. The procedure was performed with some difficulty because of the impression that the needle quickly entered into dense intrathoracic tissue. Analysis of the fluid revealed 917 erythrocytes per cc. and 60 leukocytes per cc. (40 granulocytes and 20 lymphocytes). Smear and cultures of the fluid failed to reveal organisms. Bronchoscopy was not performed.

On 13 July 1954 thoracotomy was performed through the fourth left interspace with removal of a rib and aspiration of straw-colored fluid. A biopsy of the lung tissue was obtained and the incision closed.

The patient has made a satisfactory postoperative recovery, has minimal exertional dyspnea at the present time, and is preparing to return to work.

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DISCUSSION

Doctor Zikmund: I would like to call on Doctor Fries* to show us the x-rays in this case.

Doctor Fries: Before showing the x-rays, I would like to present the photographs of this patient made four years ago, in 1950, at the time of her first admission (fig. 1A and B). They demonstrate enlargement of the left hemicranium and facial bones with proptosis of the left eye.

Figure 1. Photographs of patient in 1950, demonstrating enlargement of the left hemicranium and facial bones with proptosis of the left eye. (A) *Front and* (B) *side views.*

We have photographs from this admission (four years later) and the findings are similar, indicating that no apparent change has taken place. The x-ray findings in the skull correspond to what is seen clinically (fig. 2A and B). The entire left side of the skull and the facial bones are involved by a bony disease. We see alternate areas of density and radiolucency, and expansion to the left hemicranium. The largest measurement of the expanded skull is 7 cm. The lesion extends to the midline with a normal cranium on the right side. You can see that the rim of the right orbit and the mandible are within normal limits. The Water's view very clearly demonstrates the tremendous enlargement of the skull resulting in encroachment and erosion of the outer table of bone in addition to involvement of the inner table.

We have a chest x-ray from the previous admission four years ago demonstrating a large dense mass involving the entire left chest with a shift of the mediastinal contents, including the heart, to the right side. The right lung appears normal (fig. 3). There is an expanding, radiolucent lesion involving the entire right eighth rib. A similar lesion involves the third left rib.

*Lt. J. W. E. Fries (MC) USN, Assistant Radiologist.

Comparing the present x-rays with the studies made four years previously, we find no change in the skull, chest, or rib lesions. Because the chest lesion shows no change it can be assumed that it may represent a benign process. We believe this chest lesion can possibly represent a manifestation of fibrous dysplasia. Our reasoning is as follows: The skull is of tremendous thickness, indicating that extensive fibroblastic growth has taken place. This same process could be present in the left third rib with the production of a large dense mass growing

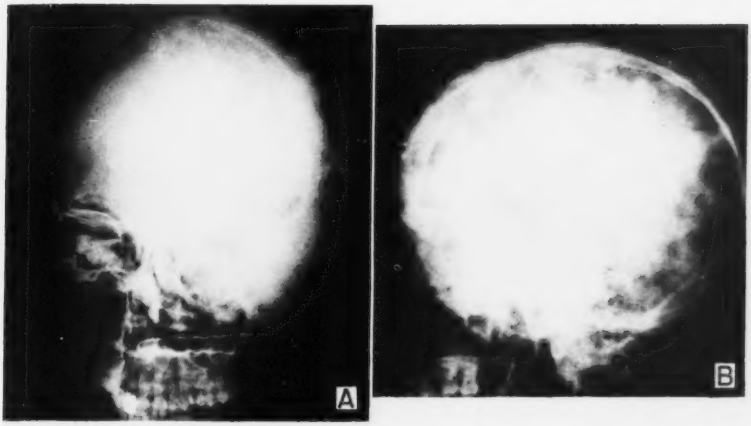

Figure 2. Skull roentgenograms showing involvement of the entire left side of the skull and the facial bones, with alternate areas of density and translucency. (A) *Posteroanterior and* (B) *lateral views.*

into the left thoracic cage. The thoracentesis and diagnostic pneumothorax were helpful because the injected air defined the lower limits of this mass. Because air did not dissect superiorly to separate the mass from the chest wall it was assumed that the origin of this tumefaction was somewhere in the superior part of the left thoracic cage, most likely in the third rib. In the differential diagnosis, more likely than fibrous dysplasia would be a large teratoid tumor because these tumors grow to large size and may not change over a period of years. The third possibility would be a benign mesothelioma.

Doctor Zikmund: Thank you. I would like to call on Doctor Carr* for comments on the skeletal lesions seen in this case.

Doctor Carr: In a lesion such as Doctor Fries has demonstrated, and such as our history gives us, we have to think of lesions of bone which have their origin in the medullary portion of the bone and which expand bone. In this particular lesion we have gone through the sections previously, as well as the x-rays; apparently there are no long bones involved. We note lesions involving the skull, ribs, and at least one vertebral body.

*Capt. C. R. Carr (MC) USN, Chief of Orthopedics.

Those lesions which commonly give pictures with many variations of an expanding medullary lesion of the bone may be listed for purposes of reference; these include solitary bone cysts, giant-cell bone tumors, fibromas of bone (which are usually considered to be due to cell rests or arrest of development in ossification of an individual bone); enchondromas which are quite often confusing because they can be multiple;

Figure 3. Chest roentgenogram in 1950 demonstrating a radio-opaque density involving the entire left chest with a shift of the mediastinal contents to the right.

the cystoid forms of myeloma; Paget's disease; osteodystrophia fibrosa generalisata (this is the older term, of course, for von Recklinghausen's disease of hyperparathyroidism and its several manifestations); skeletal xanthomatosis; and the fibrous dysplasias, polyostotic and monostotic.

Let us cover xanthomatosis quickly. There is a whole group of these which are usually considered as "storage diseases" of bone. The pathologist and the bone physiologist will probably argue with me a good bit about whether they are storage diseases of those particular substances; but, in general, disturbances in metabolism of keratin, phosphates, and the cholesterols will give some clue as to the type of lesion. These are: Gaucher's disease, Niemann-Pick disease, Hand-Schüller-Christian disease, and generalized osseous xanthomatosis. If we considered the skull alone, one would be quite suspicious of the Hand-Schüller-Christian syndrome.

I am inclined to believe that in this case fibrous dysplasia probably offers the best diagnostic possibility, depending upon the findings of the biospy which would differentiate it from one of the types of storage disease, notably the xanthomatous lesions. This girl did have precocious puberty. We have no evidence of pigmented spots. She is Negro and I am not familiar with the incidence of pigmented spots in Albright's syndrome in the Negro race. I hope Doctor Jeghers will be able to give us information on this. Albright's disease, or Albright's syndrome, is simply one manifestation of fibrous dysplasia.

Lichtenstein and Jaffe, in 1942, attempted to classify this whole group of bizarre developmental diseases of bone of this type under the term fibrous dysplasia, and I think that it is a useful classification. Albright's syndrome is one peculiar variant, probably a rather advanced one with its onset early in life.

In the differential diagnosis, hyperparathyroidism is to be considered. Remember that in hyperparathyroidism we usually have a high-serum calcium, low-serum phosphorus, and increased urinary calcium output, whereas in the various fibrous dysplasias we seldom if ever have any disturbance in blood chemistry unless it is in the phosphatase as a result of increased activity in the bones. Another thing that might be of some concern is Ollier's disease which is a synonym for dyschondroplasia. This affects the epiphyses, whereas fibrous dysplasia seldom affects the epiphyses. Another condition to be differentiated is neurofibromatosis which can give many and varied cystic lesions of the bone but is usually associated with pigmented spots and also with multiple tumors along the segmental distribution of peripheral nerves. The other diseases considered in the differential disqualify themselves pretty generally from the story we have heard, and I shall not cover them one by one. I think this case is unique and I hesitate to classify it, strictly speaking, with Albright's syndrome (1) because it lacks pigmentation of the skin, and (2) because the long bones, as far as I know, are not involved. From a nosologic viewpoint, I think if we give a disease or syndrome an eponym it should be almost identical with the original description.

Doctor Zikmund: Thank you, Doctor Carr. Doctor Hill,* will you come up front, here behind this microphone, and comment on the features of her sexual precocity?

Doctor Hill: From the gynecologic standpoint, we are interested in these people because of the fact that they have precocious puberty. However, although they may have some vaginal bleeding it is not a true menstruation because it is not associated with ovulation. It is really a passage of blood from the vagina, always irregular, and it may start at a very early age in life, in childhood, or at any time in the 'teens. Then, when these girls get to the age of puberty, they will usually settle down and have normal menstrual periods. They also may conceive and bear children at a later stage in life. These ovaries usually do not ovulate. We do not know why. One reason given is that the changes in the base of the skull suppress the anterior pituitary. This particular patient has had a disturbing surgical history because at the age of 18 she underwent a subtotal hysterectomy and removal, as far as she knows, of both ovaries and tubes. It is not clear as to just why this was done; anyhow, pelvic examination at the present time shows a typical castrate pelvis. The vagina is dry and pale, and is very firm and smooth. The cervix is just a dimpled structure and very atrophic. The corpus is absent and the adnexal regions are negative. It was interesting to me to learn that she has a normal libido and has always had a normal sexual response in both of two marriages. Two years ago she went through what she thought might have been a menopausal syndrome, as suggested by nocturnal sweats and numerous hot flushes followed by cold sensations. This gradually disappeared. Now, whether this is associated with ovarian absence or whether it may be a failure of the adrenal to produce estrogen is not clear. Maybe the adrenals have been producing estrogen for several years for this patient, as we think they do sometimes, and this has finally ceased. These, of course, are suppositions. Regarding this patient's secondary sexual characteristics, the left breast is smaller than the right although she attributes this to recent thoracic surgery. The breasts seem to be very small on both sides, there is normal suprapubic and axillary hair, and the external genitalia have normal development for a person of this age. That is about all we have to contribute on this particular patient. Sexual precocity can also occur in male children with this syndrome, but not nearly as often as in female children. The fact that the female patients do have menstrual disturbances in cases in which the skull is not involved tends to show that dysplasia of the base of the skull is probably not an explanatory factor associated with the anterior pituitary.

Doctor Zikmund: Thank you, Doctor Hill. At this moment I would like to ask Doctor Flipse* to comment on the chest x-ray with particular emphasis on the frequency of this type of chest lesion in this or related bony disease states.

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*Comdr. H. H. Hill (MC) USN, Chief of Obstetrics and Gynecology.

*Lt. M. E. Flipse, Jr. (MC) USN, Head of Chest Service.

Doctor Flipse: First of all, I would like to make a few general remarks on the so-called "blacked-out lung." When one sees an opaque hemithorax on a chest roentgenogram, the problem is to decide whether there is a congenital or acquired absence of the lung, an atelectasis or collapse of the lung either alone or associated with fluid, a diffuse pulmonary disease such as pneumonia, a large intrathoracic tumor, or pleural disease. In this particular case we can rapidly exclude the first three considerations on the basis of the history, the physical findings, and x-ray evidence of a space-occupying lesion in the left hemithorax. Thus we are left with two possibilities—some type of intrathoracic tumor or pleural disease. As far as the diseases of the pleura are concerned it is helpful to differentiate between inflammatory, mechanicocirculatory, and neoplastic diseases of the pleura. Adequate study of the pleural fluid greatly facilitates this differential diagnosis. In this case the initial thoracentesis was traumatic with bloody pleural fluid, whereas the second fluid specimen removed at the time of operation was clear and sterile. Thus we are dealing with a sterile hydrothorax, thereby excluding a hemothorax and chylothorax. These findings, in addition to the other data, tend to exclude inflammatory disease of the pleura. The neoplastic diseases of the pleura may be benign or malignant, primary or secondary.

There is a recently emphasized entity, the so-called localized fibrous mesothelioma of the pleura, which I would consider most seriously in my differential diagnosis in this case. This entity has been well described by Clagett and his associates[1] in the September 1952 issue of the *Journal of Thoracic Surgery.* Localized fibrous mesothelioma of the pleura is a benign tumor and should be clearly distinguished from a malignant pleural mesothelioma. It has been seen in patients from 20 to 70 years of age and has been known to be present for from one week to eight years before its successful surgical removal. Its weight has varied from nine grams to 5,000 grams. One reported case is quite similar to the pulmonary problem presented by our patient. There was a similar chest x-ray in a 36-year-old woman presenting symptoms of dyspnea and a known duration of disease of five years, from whom a 4,000-gram tumor was removed. These tumors are frequently associated with massive pleural effusion and about 60 percent of the patients have digital clubbing or rheumatoid arthritis-like symptoms. This tumor is benign, and the patients are cured by operation, so it is important to consider it in spite of its rarity.

As far as mechanicocirculatory disturbances of the pleura are concerned, it is well known that large intrathoracic tumors, both benign and malignant, can produce pleural effusion by pressure or resultant thrombosis in the vessels of the mediastinum and chest. The thoracentesis and replacement of a portion of the fluid with air proved that this patient did have a large tumor arising in the upper left chest associated with a pleural effusion. It is impossible to say whether the tumor had its origin in the lung, the pleura, or the chest wall. It certainly cannot

be a malignant tumor to have been present for over 12 years and to have been basically unchanged in the past four years.

It is interesting to speculate if this tumor had any relation to the underlying fibrous dysplasia of bone. This patient does have extensive involvement of the ribs on the left and there is a firm swelling of the left upper anterior chest wall, so that conceivably this tumor could represent an extension of her bone disease. However, in the literature and in Doctors Albright and Reifenstein's text, *The Parathyroid Glands and Metabolic Bone Disease,*[2] no similar case has been reported. Doctor Albright does state that a few of these patients die of cor pulmonale. He does not mention the pathogenesis of this right heart failure, so I assume it must be secondary to thoracic cage deformity, for there is no record of pulmonary involvement in this disorder.

Doctor Zikmund: Thank you, Doctor Flipse. Doctor Berley,* will you tell us what the thoracotomy procedure disclosed?

Doctor Berley: An operation was performed on 13 July 1954 under thiopental sodium (sodium pentothal)—nitrous oxide—ether anesthesia. The patient was placed in a left lateral position and an incision was made and carried down over the sixth rib. The periosteum was elevated, and a large segment of this rib was resected and sent to the pathology department for examination. The pleura was immediately seen to be thickened and firm, and as it was opened a large, lobulated tumor was evident. This tumor appeared to be a firm calcifying mass occupying almost the entire left chest cavity and was firmly adherent to all the mediastinal structures and to the left chest wall. It was obviously not amenable to surgical removal. A biopsy of the specimen was obtained and closure was effected.

Doctor Zikmund: Thank you. That gives us the basic data in the case. Doctor Jeghers,* would you, with the information presented at this time, discuss the differential possibilities and add comments pertinent to the presentation at this point?

Doctor Jeghers: I would like to discuss this case in the form of not knowing any of the new facts brought out today; in other words, what would be the reasoning if one went through this case with just the data available in the printed case history.

This is the history of a 36-year-old Negro woman who is alive. This offers the helpful point that we are dealing with a more benign condition than might otherwise be the case in the average clinical-pathological conference. There is enough data from prior medical studies to give a good background for discussion. Doctor Zikmund has read the case history in detail and I will not repeat it.

In going over this case history, it is apparent that three pivotal points may be brought out for discussion. The first is the precocious

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*Harold J. Jeghers, M. D., Professor of Medicine, Georgetown School of Medicine, Washington, D. C.

menstrual bleeding, the second is the multiple skeletal abnormalities, and the third is the nature of the disease of the left thorax with pleural effusion.

As a general rule, it is best in a differential discussion to consider two fundamentally different approaches, and to reason them out separately if possible. The first line of reasoning centers about the question of whether the whole clinical picture can be explained on one basic underlying pathologic condition, or whether multiple conditions are present. Unless our reasoning explores both paths, we may frequently overlook various diagnostic possibilities.

I would like to discuss three aspects of this case, taking up first what the thinking should be with regard to precocious menstrual bleeding which can be looked upon as part of the problem of sexual precocity.

First, with regard to the sexual precocity which implies increased sexual development and function occurring prior to the usual, accepted age: in a female, precocity with heterosexual characteristics commonly results from a disease of the adrenals and would be manifested by such features as an increased size of the clitoris, increase in hair (hirsutism), et cetera. This can be immediately excluded. When isosexual characteristics predominate, as they do in this case, various other possibilities must be considered. First, is there a lesion in the region of the hypothalamus, such as a tumor or an inflammatory disorder? Relatively few such instances in the female sex have been recorded. The long duration of the history of this case would be against this diagnosis.

Secondly, one considers the idiopathic form which is believed to be sort of a functional increase in activity in the hypothalamic center producing early activation of the gonadotropins. This is a very definite possibility. Frequently when no other reason can be found, one ends up with the diagnosis of an idiopathic type of sexual precocity.

Thirdly, sexual precocity may develop as a result of some tumor, commonly of the ovary, with excess hormonal secretion capable of producing this clinical picture. A representative example commonly given is a granulosa-cell tumor of the ovary. If this were true, the operation on the pelvis at the age of 18 would have brought out this point. The long course is also against this diagnosis, as is the fact that a granulosa-cell tumor is not associated with bony abnormalities.

Next to be considered is Albright's syndrome which, in the female, is characterized in a considerable percent of cases by sexual precocity. The mechanism of the sexual precocity in Albright's syndrome is not clear, but it may be on some hypothalamic basis. Influence of skull changes on hypothalamic function, or some changes in the mammillary bodies, are among the reasons proposed. Thus, although the explanation is not clear, it is certainly well accepted that sexual precocity is an important part of the Albright's syndrome.

Another possibility which can be readily excluded is that early in life, for some reason, this woman received medication with estrogenic substances. In looking over those various possibilities, the two which seem most reasonable in explaining on a common pathologic basis the bone lesions, the sexual precocity, and the features in the chest, would be a tumor (either in the hypothalamic area, or an ovarian tumor capable of producing estrogenic substance) associated with metastases. The possibility of a tumor with metastases can be excluded by virtue of the long duration. Albright's syndrome certainly stands on firmer ground in explaining sexual precocity and bony changes.

The various possibilities suggested by the next feature of the case, multiple skeletal abnormalities, can now be considered. My first consideration is whether in any way this could be due to a postmenopausal type of osteoporosis. This lady supposedly had a bilateral oophorectomy at the age of 18 and then later in life developed multiple bone changes with an increased alkaline phosphatase and at least one probable bony fracture. The common pattern in postmenopausal osteoporosis is primary involvement of cancellous bones which means essentially the vertebral bodies and the upper ends of the femurs. With osteoporosis the vertebral bodies often collapse rather than manifest scoliosis, and the femur shows the classical fracture of the neck. This is not true in this case, and this diagnosis can probably be excluded.

Is this hyperparathyroidism with osteitis fibrosa generalisata? The characteristic blood chemistry changes are lacking in this patient. Furthermore, there is no association with sexual precocity in this disease. Also, the abnormalities in the skull are not the type to go with hyperparathyroidism. I think this diagnosis might well be excluded.

Is this one of the lipoid granulomatoses? The xanthomatoses or an eosinophilic granuloma would be two possibilities. The bone lesions are more apt to manifest a punched-out appearance on the roentgenogram and often respond to radiation therapy. I am sure that biopsies have been taken in the past and the diagnosis would have been made if present. An eosinophilic granuloma sometimes has an eosinophilic blood response. There is an eight percent eosinophilia in this patient, but I do not think that that is enough to lead one to this possibility. The overgrowth of bone here is also against it.

Is this some form of multiple metastases? If the bone lesions had existed for only a short time, this possibility would have to be considered. The long duration of the bone lesions are against it, as would be the lack of a primary site for the origin of the metastases. In other words, could this be benign sexual precocity, with the lesion in the chest as the primary tumor source, and the bone lesions metastatic from it? Even here, the duration of the chest lesion is much against a type of tumor such as bronchogenic carcinoma with metastases to the bone. I think one may well exclude this. The ovaries have been removed in this patient. The picture is not one of an adrenal tumor. We

would be hard put to find a primary site to explain multiple bone metastases.

Is this von Recklinghausen's disease of the neurofibromatosis type? This possibility must at least be considered because if often causes multiple bone lesions. This patient lacks the characteristic *café-au-lait* pigmentation. However, it is sometimes difficult to demonstrate in Negroes. There are no skin fibromata. Particularly in women, this condition does not lead to sexual precocity. For these reasons, I believe that it would be a difficult diagnosis to establish.

We come, finally, to polyostotic fibrous dysplasia, Albright's syndrome. This entity is characterized by a somewhat segmental type of bone lesion distribution involving various parts of the skeleton and often sparing immediately contiguous bone; *i. e.*, affecting parts of the skull but not the entire skull. It tends to be of long duration and may exist through a long period of life. It commonly has some skull changes and there are reports of instances where the skull changes have produced proptosis of an eye, which is present in this case. The bone may manifest areas of both increased and decreased density and often an elevated alkaline phosphatase blood value is noted. These bone changes fit well into those which our patient shows. Especially helpful is the common association with sexual precocity in females. This also fits into the picture this patient presents.

The third part of the syndrome, the skin pigmentation, may cause some difficulty in explanation. There are several things to consider. Possibly the pigmentation is not always present. Secondly, this patient is Negro and pigmentation changes may not be noticeable. At times the spots are difficult to detect. In this particular case the pigment may not be readily detectable as such but may be simply blended with the racial pigmentation. The sexual precocity and the multiple skeletal abnormalities fit best together as an Albright's syndrome.

We are now left with the need of an explanation of the features described in the left thoracic cage. Several things are known about this thoracic lesion. This lady has a scoliosis. She has some displacement of the mediastinum to the side opposite the density in the left chest. Several possibilities would certainly come to mind. First, is this tuberculosis with tuberculous pleurisy, thickened pleura, and with some degree of pleural effusion? Against this is the fact that she had been unsuccessfully studied for this possibility as well as for the long duration. Could this be an old empyema? There is no history to go with it and after many years an empyema would not exhibit a thin serous pleural effusion with shift in the mediastinum.

One diagnostic possibility worth entertaining is the well-known fact that people with a deformed thoracic cage may develop what is known as scoliotic heart disease and may eventually manifest features of a cor pulmonale and cardiac failure. There are certain aspects of this case that are at least slightly suggestive of heart failure, such as shortness

of breath and, on several occasions, ankle edema. The characteristic features that you might like to find in generalized congestive failure, *i. e.*, increase in venous pressure and so forth, were not manifest.

Another possibility is a tumor of some sort with production of fluid by metastases or in some benign fashion, as, for example, in a Meigs' syndrome due to an ovarian fibroma. It is entirely possible for a benign tumor in the pleural cavity to produce fluid. The chest density was seen as far back as 1950 and may have been present even longer. The thoracic-cage lesion existed even longer. This period is too long to suggest any of the common malignant tumors. It certainly immediately excludes bronchogenic carcinoma and, to my mind, would also exclude a diffuse spreading mesothelioma. It would not exclude the possibility of some benign tumor of the thoracic cage producing both a fibrous reaction in the pleura and fluid, nor would it exclude a localized fibrous type of benign mesothelioma. The latter type of tumor was commented on just a few moments ago and may produce the picture of a rheumatoid type of arthritis, clubbed fingers, or even an acute osteoarthropathy. As far as I know, there is no definitive association of such a tumor with the Albright's syndrome.

The logical conclusion would be that this lady has an Albright's syndrome and an independent disease in the left thoracic cage which may well be some kind of a benign tumor with a pleural reaction, both fibrous and fluid.

Dr. Jeghers' diagnosis:

1. Polyostotic fibrous dysplasia (Albright's syndrome)
2. Benign tumor, left chest

PATHOLOGIC FINDINGS

Doctor Zikmund: Thank you, Doctor Jeghers. Doctor Turner* will you go ahead and give us the reports on the two biopsy specimens submitted to you?

Doctor Turner: There were two specimens received in the laboratory. The first consisted of a major portion of a rib which measured 17 cm. in length. No abnormality was seen upon gross examination, and on microscopic examination only normal bone was revealed. There was no bone lesion present, but the examination was of some value because it indicated that generalized bone disease was not present. The second tissue specimen consisted of a wedge biopsy measuring 2.5 cm. in its greatest diameter. The convex surface of this biopsy specimen was covered by a smooth membrane consistent with either pleura or a capsule. The cut surfaces were firm, red, and somewhat gritty. The tissue cut with very firm resistance and gave a gritty sensation as the blade passed through the tissue. Microscopic findings are illustrated in the photomicrograph (fig. 4). This lesion consists essentially of a back-

*Comdr. J. A. Turner (MC) USN, Chief of Pathology.

ground of dense fibrous tissue. You will note that the fibroblasts are quite mature, that the nuclei are small, and that there is a moderate amount of intercellular eosinophilic material. Embedded in this fibrous matrix are scattered, poorly formed bone lamellae of the so-called

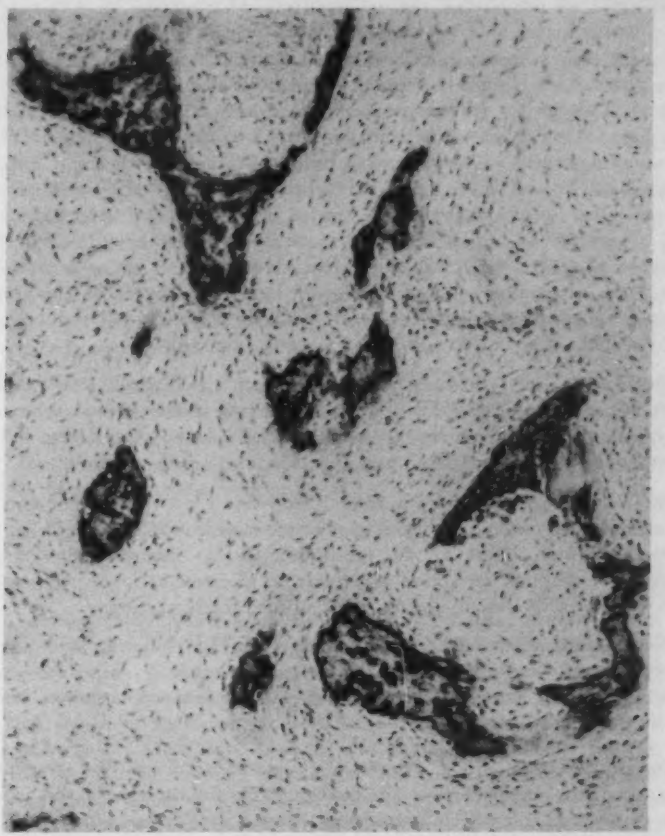

Figure 4. Photomicrograph of tissue specimen, showing background of dense fibrous tissue, mature fibroblasts, and moderate amount of intercellular eosinophilic material. (Hematoxylin and eosin stain, × 200)

bone-fiber type. This bone is very poorly calcified and lacks the usual architectural arrangement of well-formed spongy bone. About these spicules are considerable numbers of osteoblasts at frequent intervals and an occasional multinucleated osteoclast.

Pathologic diagnosis:

Fibrous dysplasia of thoracic wall

Doctor Zikmund: Thank you, Doctor Turner.

That concludes the presentation of the case, with biopsy tissue diagnosis.

Briefly, to summarize the main points of what we have given you, this is the case of a 36-year-old Negro woman who presented herself because of cardiorespiratory symptoms, and in whom significant findings included skeletal disease best described as consistent with fibrous dysplasia, sexual precocity, and the presence of a space-occupying lesion in the left hemithorax which, on thoracotomy, revealed tissue diagnostic of polyostotic fibrous dysplasia. You might ask, and I shall clear the point now, why the bone biopsy specimen revealed normal bone architecture. In the x-rays, as emphasized before the meeting by Doctor Fries, the rib that was removed was selected largely to provide adequate exposure of the left pleural cavity. It was not one of the ribs reported as showing disease by the x-ray. Had thoracotomy been feasible at a higher rib level, such as the third rib, bone microscopy would likewise have revealed fibrous dysplasia.

Doctor Plitman:* In instances of eosinophilic granuloma involving soft parenchymatous tissue in which healing takes place either after irradiation or spontaneously, what is the histologic picture in such instances, or has there been any experience along these lines?

Doctor Turner: The reports that I have read on the subsequent histologic examination of treated lesions revealed only a scarring or a normal fibrous tissue at the previous site. In contrast to Albright's syndrome, there is no active proliferation of fibrous tissue. It is simply the remains after healing rather than a proliferative change.

Doctor Plitman: I asked the question purely because at least one investigator, Doctor Snapper,* has suggested that possibly monostotic fibrous dysplasia of rib may sometimes represent spontaneous healing of an eosinophilic granuloma.

Doctor Zikmund: Doctor Turner, I should like to ask you a question. What is the significance of the presence of giant cells in this tissue? Are giant cells diagnostic features of fibrous dysplasia?

Doctor Turner: The important thing in the evaluation of fibrous dysplasia as far as giant cells are concerned is where they are located. You will notice in this photomicrograph that the giant cells were close to bony spicules where normal osteoclasts resorb bone. In the giant-cell tumors of bone, of course, giant cells are scattered throughout the stroma. That is the important differential.

Doctor Zikmund: Are there any other questions?

Doctor Flipse: We are going to have to treat this woman, perhaps in the near future. I wonder if Doctor Jeghers has any therapeutic sugges-

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*Dr. I. Snapper, Beth-El Hospital, Brooklyn, N. Y.

tion to make, or, if he has none, whether the surgeons believe that they can remove a part of this pulmonary tumor for us and perhaps help her out?

Doctor Jeghers: I do not think I could make any pertinent suggestions in regard to therapy.

Doctor Zikmund: I might furnish some brief comment on that. We have, as you know, considered whether or not this patient eventually will come in with cardiopulmonary failure and just what we might offer her. The Chief of Surgery believed, as did we, that because this is perhaps the first reported case of an Albright's syndrome with this type of pulmonary complication and, therefore, with no precedent to serve as a guide, that consideration would be given eventually to surgical removal of an adequate amount of the dysplastic tissue in order to restore the mediastinum to its normal position. Certainly, with this type of bony fibrous dysplasia, perhaps having destroyed most of the lung tissue, we could not expect to do more in order to attempt to improve terminal cardiorespiratory failure.

Doctor Hartney:* I did not hear it mentioned, but I wonder if anyone would comment on whether or not these bony lesions are progressive and whether or not there would be any chance of cerebral manifestations at some future date. Also, no one mentioned whether the enlarged liver could be secondary to the lung problem.

Doctor Zikmund: Doctor Carr, perhaps you might like to comment on the first part of that question.

Doctor Carr: Actually, the lesions in the bone in these cases of arrested development follow such a bizarre pattern that it is difficult to evaluate whether they will or will not grow. They generally grow with the bone as the child grows and they are space-occupying. They are not progressive from the standpoint of new lesions occurring. Most of them that are there have been there all along, although they may grow in size somewhat. The picture here in the skull and the ribs leaves us somewhat at a loss because we do not often see them located in just these locations. From a surgical standpoint, they may give us trouble in the long bones with possibilities of pathologic fractures and disturbances near the joints. I think that it is possible in a situation of this kind that a stimulus might exist whereby more fibroblasts would be proliferating and laying down this fibrous tissue. It would seem to me that this might have been occurring in this lung, in which case I wonder if the radiologist would have anything to suggest in the way of arresting proliferation of the fibroblastic tissue, assuming it were shown that such proliferation was occurring and that the lesion was actually expanding its size.

Doctor Fries: From the x-ray studies, there is no apparent change in this lesion over a period of four years. The growth, therefore, if any,

*Lt. (jg) T. C. Hartney (MC) USNR, Assistant in Medicine.

has been minimal. Such lesions have been treated with x-ray for the relief of pain and at times this is effective, but x-ray therapy does not apparently control the growth of the bony lesions of fibrous dysplasia. Some cases of fibrous dysplasia have been treated with cortisone, especially when pain is present, in an attempt to slow down the fibroblastic growth. These have been few in number and long-term follow-ups are not available. In this particular case it would not be indicated because recent growth of the bony lesion and pain have not occurred. The cerebral manifestations in this patient may be explained similarly to those associated with Paget's disease where the inner table of bone encroaches on the cranial contents and the underlying brain undergoes atrophy. In fibrous dysplasia there is a known relationship between extensive frontal bone involvement and psychosis.

Doctor Zikmund: The liver was noted to have been abnormally enlarged, but not tender. The Rondot-Pasteur sign was negative. The question of cor pulmonale obviously would be a matter of how much clinical progression there may be in the present mediastinal problem with resultant greater load on the heart. I think it is really an unpredictable situation whether or not her death will eventually be cardiac or some other complication of her disease, perhaps intracranial. I would say that it is a very real possibility that she will eventually die a cardiac death, most likely from cor pulmonale. Her neck veins are not distended. Certainly with the cardiac silhouette so badly obscured and the electrocardiogram not showing significant changes, present clinical findings at this time are inadequate for diagnosis of cor pulmonale, although obviously that seems to be the direction in which her problem leans and which is accounting for symptoms of effort-induced shortness of breath and some of the other symptoms of the cardiorespiratory system already stated.

This case is included in a series to be published in the *American Journal of Roentgenology, Radium Therapy, and Nuclear Medicine* by John W. Fries, M. D., entitled "Fibrous dysplasia of the skull and facial bones; a critical analysis of 39 pathologically proven cases."

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The general uses of antibiotics in military medicine are similar to the general civilian uses . . . On the battlefield the use of antibiotics does not preclude, minimize, or modify the accepted surgical principles of wound toilet, débridement, and secondary closure.

—GEORGE E. ARMSTRONG, Major General, MC, USA
in *Medical Arts and Sciences,*
p. 6, First Quarter, 1954

Perforated Gastric Ulcer and Gastrocolic Fistula Associated With Prolonged Cortisone Therapy

KENNETH P. BACHMAN, *Lieutenant Commander (MC) USN*
CHARLES E. ROGERS, *Lieutenant (MC) USN*

WITH the advent of the widespread use of cortisone and corticotropin (ACTH) in therapy, it was not long before the possible side effects of these powerful drugs became manifest. One of these, peptic ulceration and its complications, has prompted this report.

Numerous clinical observations suggest a relationship between unusual amounts of circulating adrenal cortical hormones or corticotropins and peptic ulcerations. Repeated warnings against the use of these drugs in patients presenting a history of peptic ulcer are found in the literature.[1,2,3] Complications such as massive hemorrhage[2] and perforation[4,5] have been reported. A careful search of the literature has, however, failed to reveal any case in which silent, spontaneous perforation of a gastric ulcer occurred with the formation of a gastrocolic fistula. Such a case is here presented.

CASE REPORT

A 33-year-old woman had been well until she experienced the onset of severe psoriasis involving about 50 percent of her skin surface about nine years prior to admission to this hospital. Within three years after the onset of the psoriasis almost all of the skin was involved and arthritic changes were evident in the joints of both hands and feet. Two years after the onset of the psoriatic arthritis, the joint changes had become severe enough to render her a semi-invalid. She was first hospitalized in January 1951. From 1951 to the last admission she was generally ambulatory, although her arthritis and skin condition gave no evidence of substantial remission.

The dates of hospitalization as related to cortisone and ACTH therapy are summarized in table 1. It should be noted that ACTH was administered only on two occasions, the first time in 1951 and the second during the preoperative and postoperative periods. Also of importance is the fact that during the 12 months prior to

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her death she received a minimum of 50 mg. of cortisone daily and during the last six months of life, 100 mg. or more.

TABLE 1.

Admission dates	Cortisone	ACTH
In-patient 1-22-51 to 4-3-51	200 mg. orally daily, gradually decreasing to 25 mg. daily	100 mg. daily for 27 days
Out-patient 4-3-51 to 6-18-51	25 mg. orally daily	None
In-patient 6-18-51 to 8-18-51	500 mg. intramuscularly daily for 21 days	None
Out-patient 8-18-51 to 2-4-53	None	
In-patient 2-4-53 to 2-14-53	100 mg. orally daily	None
Out-patient 2-14-53 to 8-5-53	50 mg. orally daily	None
In-patient 8-5-53 to 9-22-53	100 mg. orally daily	None
Out-patient 9-22-53 to 1-29-54	100 mg. orally daily	None
In-patient 1-29-54 to 2-18-54	Variable—averaging 100 mg. daily	During pre- and post-operative phase

In January 1954 she was admitted to this hospital complaining of mild abdominal cramps of one week's duration, associated with severe diarrhea. The diarrhea was related to the intake of foods, and ingested items appeared in the stool as early as 20 minutes after eating. On rare occasions she had experienced nausea and vomiting with this attack. There was no previous history of gastrointestinal disease. The diagnosis of a gastrocolic fistula was considered, and later established by gastrointestinal roentgenographic series (figs. 1 and 2). The fistula appeared to be located along the greater curvature and to empty into the mid-transverse colon. Although the patient was not a good operative risk, it was obvious that surgical intervention was necessary. She was, therefore, given intravenous infusions of serum albumin, fructose solutions, and electrolytes in an effort to prepare her for surgery.

Seven days prior to operation a sudden drop in blood pressure occurred and it was necessary to add small amounts of levarterenol bitartrate (levophed) to the solutions being administered intravenously to maintain the systolic pressure at 100 mm. Hg.

Cortisone was increased to 100 mg. by mouth and 100 mg. intramuscularly and in 24 hours the patient's blood pressure stabilized. On each of the two days before operation 200 mg. of cortisone intramuscularly and 40 units of ACTH intravenously were given.

Figure 1. Roentgenogram demonstrating the fistulous tract between the stomach and the colon.

At laparotomy the gastrocolic fistula was easily mobilized because there was almost no fibrous tissue reaction in either the bowel wall or the omentum. The repair was effected by closing the stomach and colon with transverse sutures using two layers of No. 0000 silk.

During the operation and through the postoperative period until the patient's death her blood pressure was maintained above 100 mm. Hg systolic only by the addition of levarterenol bitartrate to intravenous infusions. Blood volume and red cell mass deficit had been corrected prior to operation and postoperative determinations were found to be within normal limits. The

patient responded from anesthesia but never returned to a responsive speaking state. She died suddenly after lapsing into shock and coma.

Figure 2. Roentgenogram showing the defect in the greater curvature of the stomach.

The anatomic diagnoses at autopsy were: (1) bilateral adrenal atrophy; (2) generalized severe chronic dermatitis; (3) status, post repair of gastrocolic fistula with intact suture lines; (4) benign ulcer lesser curvature of stomach; (5) bilateral thromboses of the distal inferior radicals of the pulmonary arteries with multiple bilateral pulmonary infarcts; (6) bronchopneumonia; and (7) marked fatty degeneration of the liver.

COMMENT

This case illustrates two of the more serious complications that may result from prolonged cortisone therapy, namely peptic ulceration and adrenal atrophy. The latter, as has been pointed out by Fraser and associates[6] and Bakke,[7] may be associated with irreversible shock.

It may be further noted that this patient developed two gastric ulcers, one of which perforated and resulted in a gastrocolic fistula, apparently without any subjective signs or symptoms of gastrointestinal disease. Her complaints were evidenced only after a gastrocolic fistula had occurred with resultant severe diarrhea and mild gastrointestinal distress.

Possibly the euphoria associated with cortisone therapy played a part in her sense of well-being.

SUMMARY

During prolonged cortisone therapy a patient with psoriasis and psoriatic arthritis developed two gastric ulcerations. One of the ulcers perforated, resulting in a gastrocolic fistula. The latter complication was made evident only after the sudden appearance of severe diarrhea without any previous signs or symptoms of gastrointestinal disease.

In spite of cortisone, ACTH, levarterenol bitartrate, and adjunctive therapy, death occurred postoperatively in irreversible shock. Postmortem examination revealed bilateral adrenal atrophy.

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DECREASE IN MORTALITY OF RHEUMATIC FEVER

The mortality from rheumatic fever, which has been decreasing for many years, declined even more rapidly in the past decade. This recent improvement has been due in part to general betterment in environmental and living conditions, and more particularly to the greater control over streptococcal infections with sulfa drugs, penicillin, and other antibiotics. The new therapy has been useful in preventing both initial and recurrent attacks of rheumatic fever.

—in *Statistical Bulletin*, p. 5, Aug. 1954

Intraoral Open Reduction of Fractured Edentulous Mandible

ROBERT BONDA, *Captain, USAF (DC)*

ONE OF the prime concerns in the treatment of osseous fractures is satisfactory immobilization. Immobilization of a fractured mandible in an edentulous patient sufficient to promote good bony union may not be easily established. In some cases, as in the one to be presented here, additional injuries complicate the treatment plan. Cranial injuries, which in many cases are associated with facial trauma, not only limit the selection of anesthetic and analgesic agents but also increase the operative risk. Multiplicity of facial injuries adds to the complexity of ascertaining the treatment of choice in the individual case.

When it has been decided that an open reduction is indicated for a fracture of an edentulous mandible, the intraoral approach should be given consideration. It is advocated that this approach be used whenever possible. In many cases it offers decided advantages over the extraoral approach. The factors to be considered in deciding the mode of access are: (1) facial scarring, (2) damage to facial blood vessels and motor nerves, (3) possibility of increasing contamination at the fracture site, (4) location and nature of fracture, (5) ease of accessibility to fracture site, and (6) additional existing facial injuries.

Transosseous wiring in itself is not advocated as a sole means of immobilization. It will retain the reduced segments in position, but additional support is required. Some form of intermaxillary fixation must be devised to ensure against displacement. This problem is minimized if a partial maxillary dentition exists; however, it becomes a major consideration in the edentulous patient. In the case to follow, not only was the patient edentulous, but his dentures, the only registration we might have had of his normal intermaxillary relationship and mandibular contour, were destroyed in the accident that caused his injuries. In such an instance, the relationship must be established anew and maintained.

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The following review is presented because it is believed that many of the factors that complicate mandibular fractures exist in this case and because it demonstrates the application of the intraoral approach to an open reduction of a fracture involving an edentulous mandible.

CASE REPORT

On 19 September 1953, the automobile in which a 24-year-old airman was a passenger was involved in a head-on collision with a truck. The patient was removed from the wreckage in an unconscious state and taken to the nearest civilian hospital. His lacerations were sutured and he was transferred to this hospital by ambulance three hours following the accident.

Physical examination at the time of admission disclosed a conscious, well-oriented patient complaining of pain about the face and head. He appeared to have suffered a moderately severe concussion of the brain. The subsequent retrograde amnesia that was present concerned the five hours previous to and three hours following the accident. Facial asymmetry was evident (fig. 1). There was no respiratory obstruction. Examination of the left external auditory meatus offered evidence of blood and possible cerebrospinal fluid. Pupils reacted normally to light and accommodation. Blood pressure was 130/80 mm. Hg; pulse, 75; and respirations, 20.

With the exception of abrasions of the knee, injuries were confined to the head and face. Clinical examination, substantiated by radiographic studies, established the following diagnoses: (1) A compound, comminuted, depressed fracture of the right body of the mandible causing marked facial deformity. There was considerable comminution with a large triangular fragment of bone severed from the main segments and displaced inferiorly and laterally (figs. 2 and 3). (2) A fractured, disarticulated left condyle of the mandible which was displaced forward and medially. (3) A fracture of the nasal bones without deformity. (4) Right periorbital ecchymosis. (5) Lacerations of the face and mucous membranes of the mouth. In addition to the above listed facial injuries were a moderately severe concussion of the brain, and a possible basilar skull fracture.

Intraoral examination revealed an edentulous mouth. The fracture of the right body of the mandible was compounded into the oral cavity causing a laceration of the mucous membrane. The posterior segment was depressed medially and locked in a lingual relationship to the anterior segment. There was marked limitation of mandibular movement. Although the patient could with some difficulty close his lips, he could not approximate his mandible

to his maxilla. Impressions taken at a later date were used to obtain study models, which clearly showed the discrepancy in the contour of the mandibular ridge.

The patient was kept at bed rest. On the sixth day, under local anesthesia, the fracture site of the right body of the mandible was exposed by an intraoral approach and débrided. Numerous detached chips of bone were removed. The large triangular frag-

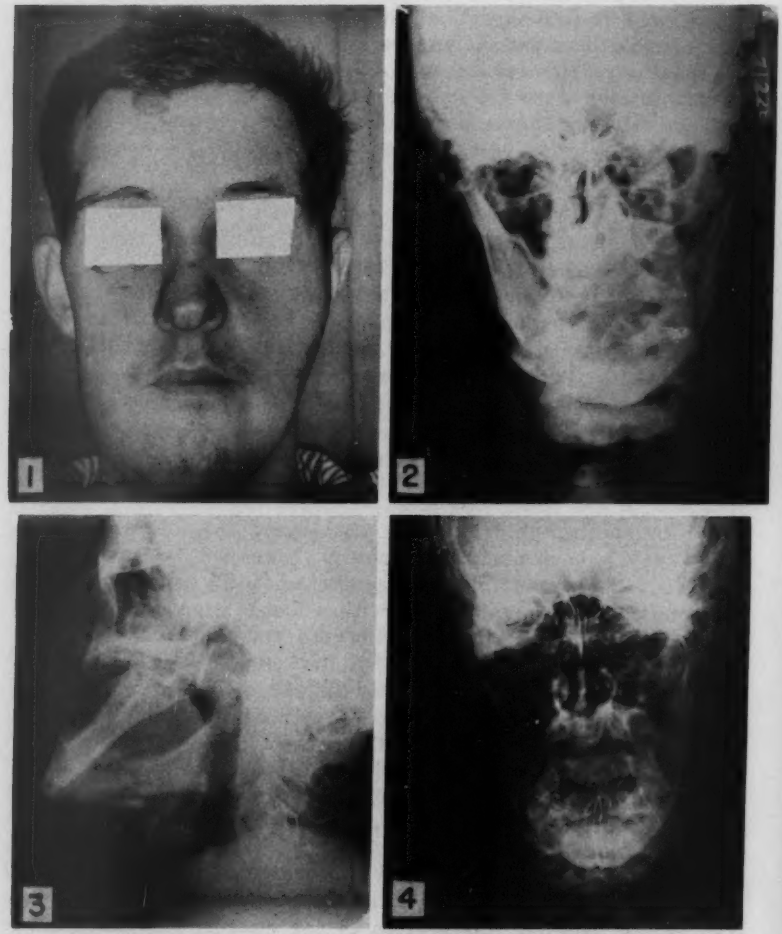


Figure 1. Appearance of the patient before treatment. Facial asymmetry is evident. Figure 2. Posteroanterior view of the skull, demonstrating fractures, amount of displacement, and comminution. Figure 3. Lateral oblique view of the mandible, demonstrating fracture, amount of displacement, and comminution. Figure 4. Posteroanterior view of the skull, demonstrating the interosseous and circumferential wires with the mandibular splint in position.

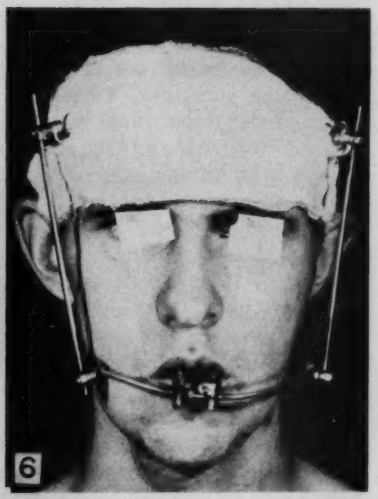
ment of bone which was reported on the radiographic examination was attached to the periosteum and therefore retained. Using a No. 41 bone bur and an electric engine, a hole was made through the body of the mandible on each side of the fracture site. The displaced segments were favorably positioned and maintained in their proper alinement by the insertion of a 25-gage, stainless steel interosseous wire. The mucous membrane was approximated and sutured with No. 000 catgut.

Immediately following the closure, an impression of the mandible was taken with hydrocolloid, a stone model was made and an acrylic splint constructed with self-curing acrylic. While the splint was being prepared, circumferential wires were placed around the mandible. A curved 20-gage, 2½-inch Luer needle was inserted into the floor of the mouth closely approximating the lingual cortical plate of the mandible, and continued until the point of the needle pierced the skin beneath the body of the mandible. The wire was inserted through the needle and the needle was then removed. This process was repeated on the buccal aspect of the mandible so that the wire encircled the mandible with both free ends remaining in the mouth. One wire was positioned distal to the fracture site around the right body, one around the left body, and one around the symphysis menti. As soon as the acrylic splint was delivered to the operating room, it was prepared for insertion into the mouth. The splint was then positioned and firmly attached to the mandible by the three circumferential wires. The impinged soft tissues were freed to avoid dimpling of the skin and underlying tissues as the wire was being tightened intraorally. This was accomplished by following the wire with a No. 11 scalpel blade up to the inferior border of the mandible. The procedure was then completed and the patient returned to his bed. No attempt was made to reduce the fracture of the left condyle of the mandible (figs. 4 and 5).

The problem was then to stabilize the mandible in this edentulous patient. An impression of the maxilla was obtained and a wax bite block made. After attempting to establish reasonable vertical and centric positions, the wax block was processed in acrylic. The anterior portion of the block was relieved to facilitate feedings. Two brass rods were placed on the buccal aspect of the maxillary acrylic block so that they would protrude from the mouth, and in a position which permitted closure of the lips. A plaster headband was fashioned and so constructed that brass rods attached to it would stabilize the maxillary denture. The maxillary bite block and mandibular splint were sealed together with self-curing acrylic and the splints secured to the headband. The fractured mandible was then immobilized (figs. 6 and 7).

The patient was maintained in this position for a period of six weeks. His facial lacerations healed satisfactorily and the periorbital ecchymosis subsided. There was little displacement of the nasal bones, making reduction unnecessary.

During his convalescence, the patient complained of nausea and severe, constant headaches in the occipital and nuchal regions. Neurologic consultation and examination, including an electroencephalogram, taken following the removal of the plaster headband and attachments on 9 November, suggested a postcon-



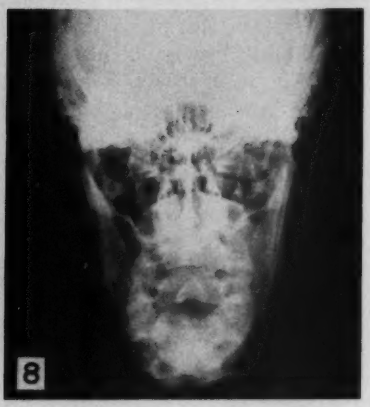
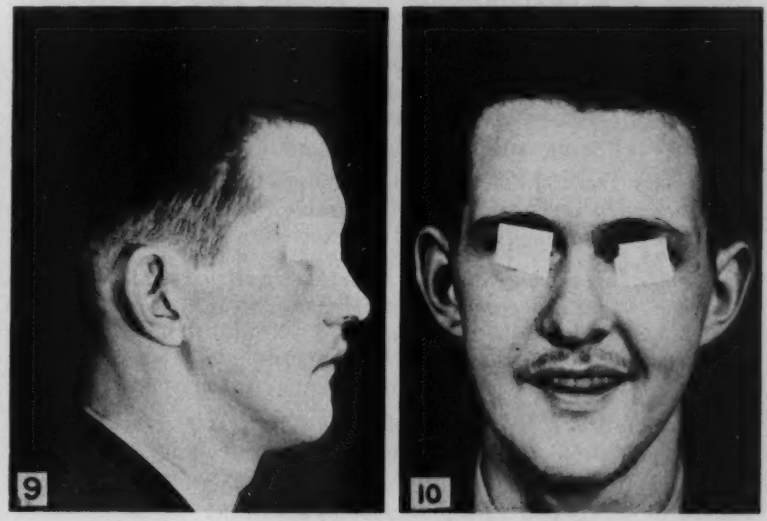


Figure 5. Lateral oblique view of the mandible, demonstrating the interosseous and circumferential wires with the mandibular splint in position. Figure 6. Patient with plaster headband and attachments. Figure 7. Posteroanterior view of the skull, showing the plaster headband, attachments, and splint. Figure 8. Posteroanterior view of the skull after completion of treatment.

cussion syndrome. Basilar skull fracture was not demonstrated radiographically. On 17 November, after 60 days of hospital confinement, he was granted a convalescent leave. The intraoral splint had been removed along with the headband and attachments on 9 November, following six weeks of immobilization. His headaches had lessened and the facial injuries had healed without complications. There was no difficulty in mandibular movement and, although the fractured condyle remained disarticulated from the fossa, the joint functioned without limitation.



Figures 9 and 10. Appearance of the patient after completion of treatment.

The patient was readmitted to the hospital on 10 December. His condition was satisfactory and the previous neurologic complaints no longer existed. Radiographic studies demonstrated bony healing at the sites of fracture. Under local anesthesia (15 December), an incision was made along the alveolar ridge on the right body of the mandible. The mucous membrane was reflected and the interosseous wire was removed. The mandible was tested by exerting pressure at the symphysis and the angle, and no movement at the sites of fracture could be demonstrated. The mucosa was sutured with No. 000 silk. Three days afterward, the sutures were removed and he was discharged from the hospital.

The patient was observed and treated in the outpatient clinic for four months following his discharge. During that time he was referred to the prosthetic department for dentures. In March, treatment was considered completed and the patient was allowed to proceed to his next military assignment (figs. 8, 9, and 10).

SUMMARY AND CONCLUSIONS

In many cases involving a fracture of the mandible an open reduction is indicated. It is suggested that in the patient with an edentulous mandible, the surgeon first consider an intraoral approach to the fracture site. Some of the factors to be considered in deciding on the mode of access are facial scarring, damage to facial blood vessels and motor nerves, possibility of increasing contamination at the fracture site, location and nature of the fracture, ease of accessibility to fracture site, and additional facial injuries.

It is my belief that in the case presented here the intraoral approach was the treatment of choice. Treatment of the patient was complicated by the fact that he had sustained additional injuries.

Although there are several other accepted methods of treatment that may have produced equally desirable results, it is proposed that the method here described be considered among the satisfactory ones.

FUNCTIONAL MOUTH PROTECTORS

In view of the fact that functional mouth protecters have been developed for some time, it is surprising that they are not more popular among amateur athletes. One of the reasons is the failure of the dental profession to educate the laity concerning the absolute necessity of the use of mouth protectors in contact sports. Another reason is that the technics used in their fabrication have made the cost prohibitive in the majority of cases. . . . A functional mouth protector not only lends protection to the oral cavity and associated structures but also minimizes the force of blows transmitted to the brain—blows which might lead to unconsciousness, concussion with permanent or cumulative injury to the brain, and, in extreme cases, even to death.

—GEORGE WATTS, D. D. S., et al.
in *Journal of American Dental Association,*
p. 8, July 1954

A New Method for Blood Carbon Monoxide Determinations

JAMES N. WAGGONER, *Lieutenant (MC) USNR*
MARION L. PERNELL, *B. S.*

AS PART of an investigation into aviation hazards conducted at this naval air station, we were interested in measuring blood carbon monoxide (CO) levels. The major problem encountered was that of performing any sizable number of blood CO determinations,* and a definite need was seen to exist for some method whereby large numbers of blood CO analyses could be readily and accurately performed. Numerous methods previously devised have met with varying degrees of success, but none has obtained the desired degree of accuracy. Probably the favorite method of determination used today, the volumetric method of Van Slyke, gives results which are considered to be within one percent of the true values. This test takes 20 minutes, however, and only one determination can be performed at a time.

We believe that our method described below offers the best means yet proposed for performing blood CO determinations simply, inexpensively, rapidly, and with a reasonable degree of accuracy.

The series reported here covers 97 blood CO determinations for which values have been determined by this new method and checked for accuracy against the Van Slyke volumetric method.

The results of these comparisons reveal that the answer obtained from the new method is within two percent of the value obtained by the Van Slyke method. The test takes only 10 minutes to complete, and several determinations can be run simultaneously. We have performed six determinations together, and have invariably received the results within 25 minutes.

The cost of the necessary equipment and reagents is well under $10 for 100 determinations. This compares favorably with the $150 listed price for the Van Slyke equipment alone, and

*A large number of CO air determinations were made with ease by use of the carbon monoxide indicating tubes obtained from the Mine Safety Appliances Company.

From U. S. Naval Air Station, San Diego, Calif. Dr. Waggoner is now at Medical Department, United Air Lines, Chicago, Ill.

the $1,250 purchase price of such instruments as the spectrophotometer.

METHOD

The reagents used are 0.3 gram saponin, 0.8 gram potassium ferricyanide, 0.4 cc. lactic acid, and 0.3 cc. caprylic alcohol. These materials are put into a clean dry beaker with distilled water in sufficient quantity to make 100 cc. This solution is to be made up on the day during which determinations are to be made.

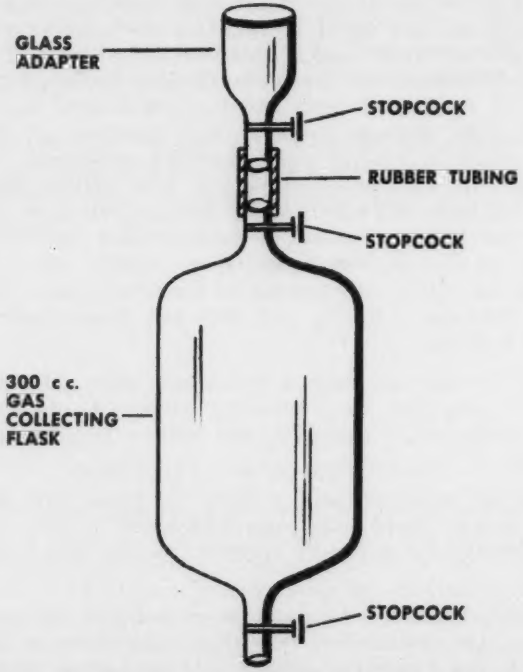


Figure 1. Gas collecting flask for blood CO determinations, with glass adapter in place.

1. All air is evacuated from a 300-cc. gas sampling flask with stopcocks.

2. With a glass adapter arranged on the flask as indicated in figure 1, 1 cc. of whole blood (to which sodium citrate was added as an anticoagulant at the time the blood was drawn) is placed in the adapter.

3. Five cubic centimeters of the above-described solution is added to the adapter.

4. With the bottom stopcock of the flask closed, the stopcocks on the top of the flask and on the adapter are opened, thus allowing the blood and solution to be drawn into the flask.

5. The top stopcock is closed and the adapter is removed.

6. The flask is shaken for five minutes.

7. A carbon monoxide indicating tube for the detection of CO in air is attached to one end of the flask.

TABLE 1. *Conversion table for carbon monoxide determinations by the method described in this report*

Reading obtained via CO-indicating tubes	Theoretic estimation of blood CO in percent of saturation
0.00	0.0
0.001	1.5
0.002	3.0
0.0025	3.8
0.004	6.0
0.005	7.5
0.008	12.0
0.01	15.0
0.02	30.0
0.04	60.0
0.05	75.0
0.066	100.0

8. Both stopcocks on the collecting flask are opened. A rubber bulb accompanying each purchase of a CO indicating tube is attached to the tube and collapsed. A finger placed over the air outlet of the rubber bulb will allow the bulb to slowly fill, thus drawing air from the flask through the CO indicating tube.

9. In the center of the indicating tube is a small yellow area which on exposure to various concentrations of CO gas changes shades through green to blue. Because any CO in the blood was liberated into gas via the above method, the air drawn through the indicating tube will change the color of the test area in the tube directly in proportion to the concentration of CO gas. A color chart is provided with each set of CO indicating tubes purchased. The color of the tube is matched with the appropriate color on the colorimetric chart. The corresponding figure listed below each color on the chart is thus obtained.

10. This figure is converted to the final answer of percentage saturation of CO in the blood by use of the simple conversion table given above (table 1). These figures were obtained by calculating the amount of blood present and the dilution factor of CO liberated from the blood into a flask containing 300 cc. of air.

SUMMARY

A new method for determining blood carbon monoxide levels, described here, is believed to be quicker, more accurate, and less expensive than methods now in use. It is hoped that if such a method is generally adopted its advantages will stimulate an increase in the number of blood CO determinations wherever personnel are exposed to the products of combustion or oxidation. Thus a greater degree of public safety may be attained.

TO TELL OR NOT TO TELL

In all my experience no patient has ever asked me afterward whether the tumor was malignant or not. . . . Once, in Dr. Cushing's clinic, when I was first getting experience in these things, Dr. Cushing had a patient who had been on the Yale football team when Cushing was there. They were good friends. Those were in the days of the flying wedge, when playing football really took courage of no small order. This man was a star football player in those days. He was a big, powerful, driving sort of man who had been a big executive in a manufacturing plant. He asked Dr. Cushing: "Harvey, I want to know what's the matter with me?" Dr. Cushing told him that he had a brain tumor and that he had to be operated on. He said, "All right." After the operation he said to Dr. Cushing in my presence: "How long do I have to live? I have to arrange my affairs. I have important commitments and I must know how to take care of them." Cushing hesitated a moment and told him: "Well, from six months to a year." The man was sitting in a chair at the time, he turned white as my coat and slid right down out of the chair and on the floor in a complete faint. We had to pick him up to get him back to bed. I remembered that experience and I decided that I would always lie to patients if they asked me.

—PERCIVAL BAILEY, M. D.
in *GP*, p. 81, Sept. 1954

PROMOTIONS OF OFFICERS

The following officers of the military medical services on active duty in the Army, Navy, and Air Force have recently received temporary promotions to the grade indicated:

Medical Corps

Wallace E. Allen, *Capt., USN*
Thomas E. Atkinson, Jr., *Comdr., USN*
Richard B. Austin, *Lt. Col., USA*
Lawrence E. Banks, *Comdr., USN*
Norman L. Barr, *Capt., USN*
Edward L. Beckman, *Comdr., USN*
Daniel W. Boone, *Capt., USN*
Ernest M. Bralley, Jr., *Lt. Col., USA*
Clement D. Burroughs, *Capt., USN*
Robert O. Canada, Jr., *Capt., USN*
Manley J. Capron, Jr., *Comdr., USN*
Frank B. Clare, *Comdr., USN*
Marshall Cohen, *Capt., USN*
Mark S. Curtis, *Capt., USN*
Edward L. DeWilton, *Comdr., USN*
Donald D. Flickinger, *Brig. Gen., USAF*
Richard L. Fruin, *Capt., USN*
Shirley A. Fuhring, *Capt., USN*
James A. Grindell, *Capt., USN*
Charles S. Hascall, Jr., *Capt., USN*
Lewis L. Haynes, *Capt., USN*
Bruno O. Junnila, *Capt., USN*
Robert S. Kibler, *Comdr., USN*
Everett P. Kirch, *Capt., USN*
Gene N. Lam, *Maj., USA*
John B. MacGregor, *Capt., USN*
Robert H. Mershon, *Capt., USN*
Donald W. Miller, *Capt., USN*
Nicholas M. Musso, *Capt., USN*
Charles B. Newton, *Comdr., USN*
Emmett F. Norwood, *Capt., USN*
John R. Palmer, Jr., *Comdr., USN*
Jack W. Passmore, *Lt. Col., USA*
William H. Powell, Jr., *Maj. Gen., USAF*
Lester J. Pope, *Capt., USN*
Francis T. Rafferty, *Maj., USA*
Reginald R. Rambo, *Capt., USN*
Jesse F. Richardson, *Capt., USN*
William C. Robinson, *Comdr., USN*
John S. Shaver, *Capt., USN*
Edward F. Slosek, *Capt., USN*
Robert A. Stalter, *Comdr., USN*
John D. Walters, *Capt., USN*
Dale B. Watkins, *Comdr., USN*
Frederick E. Wetzel, *Comdr., USN*
Norman B. Yourish, *Maj., USA*

Dental Corps

Conrad H. Brandt, *Capt., USN*
Rosolino J. Curreri, *Comdr., USN*
Ronald C. Dove, *Capt., USN*
Stanley W. Eaton, *Capt., USN*
Francis W. Hughes, *Comdr., USN*
Gordon M. Hunzicker, *Capt., USA*
Joseph S. Hurka, *Comdr., USN*
Edmund E. Jeansonne, *Capt., USN*
Anthony K. Kaires, *Comdr., USN*
Wayne F. Larrabee, *Capt., USA*
Dexter R. MacDonald, *Comdr., USN*
Donald T. Marquis, *Comdr., USN*
Edward W. Moore, *Comdr., USN*
James T. Mudler, *Capt., USN*
William D. Owen, *Capt., USN*
John V. Reilly, *Comdr., USN*
Dale B. Ridgely, *Brig. Gen., USA*
Charles E. Rudolph, Jr., *Comdr., USN*
Ralph H. Stowell, *Comdr., USN*
Myron G. Turner, *Capt., USN*

Veterinary Corps

Everett H. Akins, *Lt. Col., USA*
Wesley A. Clem, Jr., *Lt. Col., USA*

Medical Service Corps

Edward J. Anderson, Jr., *Lt. Col., USA*
Paul F. Austin, *Lt. Col., USA*

This new feature will appear monthly. Listings will be limited to promotions published in orders and dispatches dated subsequent to 1 Oct. 1954.—*Editor*

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Medical Service Corps—Continued

Thomas E. Baker, *Lt. Col., USA*
George A. Barunas, *Comdr., USN*
Herbert F. Boudeau, *Lt. Col., USA*
Bernard F. Duwel, *Comdr., USN*
Floyd C. Egger, *Lt. Col., USA*
Leon P. Eisman, *Comdr., USN*
Thomas M. Floyd, Jr., *Comdr., USN*
Conard C. Fowkes, *Comdr., USN*
Robert L. Henry, *Comdr., USN*
Fay O. Huntsinger, *Capt., USN*
George A. L. Johnson, *Comdr., USN*
John E. Kelley, *Comdr., USN*
Paul R. Kent, *Comdr., USN*
Frederic J. Lewis, Jr., *Comdr., USN*
Harry H. Linder, *Comdr., USN*
John F. Lodato, *Lt. Col., USA*
Arthur R. McAlpine, *Lt. Col., USA*
Frank J. Mitchell, *Comdr., USN*
Herman Molish, *Comdr., USN*
Ernest K. Montague, *Lt. Col., USA*
Eugene J. Mullaghy, *Lt. Col., USA*
Arion B. Nibbelink, *Lt. Col., USA*
Thomas E. Shea, Jr., *Comdr., USN*
Royce K. Skow, *Comdr., USN*
George S. Stains, *Comdr., USN*
Ralph L. Vasa, *Comdr., USN*
Erwin W. White, *Comdr., USN*
Wayne W. Willgrube, *Comdr., USN*

Nurse Corps

Martha O. Aycock, *Lt. Comdr., USN*
Annette Baer, *Lt. Comdr., USN*
Alma C. Ballantyne, *Lt. Comdr., USN*
Agatha A. Baranauskas, *1st Lt., USA*
Thelma R. Bare, *Lt. Comdr., USN*
Ethel L. Battin, *Lt. Comdr., USN*
Lucy R. Benjamin, *Lt. Comdr., USN*
Anna J. Benson, *Lt. Comdr., USN*
Margaret R. Berry, *Lt. Comdr., USN*
Burdette M. Blaska, *Lt. Comdr., USN*
Rita M. Brochtrup, *Lt. Comdr., USN*
Alberta S. Burk, *Comdr., USN*
Gladys V. Bussey, *Lt. Comdr., USN*
Hazel E. Clark, *Lt. Comdr., USN*
Rita D. Clarke, *Lt. Comdr., USN*
Ruth M. Cohen, *Lt. Comdr., USN*
Essie E. Coxsey, *Lt. Comdr., USN*
Mary E. Crenshaw, *Lt. Comdr., USN*
Celia M. Davis, *Lt. Comdr., USN*
Carol L. Dunning, *Lt. Comdr., USN*
Gladys E. Dvorak, *Comdr., USN*
Anne M. Egan, *Lt. Comdr., USN*
Norma A. Ellingson, *Lt. Comdr., USN*
Helen S. Entriken, *Lt. Comdr., USN*
Evelyn I. Erickson, *Lt. Comdr., USN*
Thelma L. Feezor, *Lt. Comdr., USN*
Rose A. Flanagan, *Lt. Comdr., USN*
Dorothy M. Gale, *Lt. Comdr., USN*
Evelyn D. Glancy, *Lt. Comdr., USN*
Mary Gresko, *Lt. Comdr., USN*
Mary C. Grimes, *Comdr., USN*
Margaret L. Haley, *Comdr., USN*
Eleanor M. Harrington, *Lt. Comdr., USN*
Mary A. Harrington, *Lt. Comdr., USN*
Edna P. H. Holte, *Lt. Comdr., USN*
Marie A. Knowles, *Lt. Comdr., USN*
Clara L. Lampp, *Comdr., USN*
Mary M. Langton, *Lt. Comdr., USN*
Rose H. Lavigne, *Lt. Comdr., USN*
Leara B. Liebman, *Lt. Comdr., USN*
Frances L. Little, *Lt. Comdr., USN*
Nancy C. Lowe, *Lt. Comdr., USN*
Elizabeth L. Miller, *Lt. Comdr., USN*
Lucille H. Milsted, *Lt. Comdr., USN*
Eva M. Minkel, *Lt. Comdr., USN*
Gertrude H. Nelson, *Comdr., USN*
Margaret A. Noteware, *Lt. Comdr., USN*
Elizabeth O'Brien, *Lt. Comdr., USN*
Louise B. Olson, *Lt. Comdr., USN*
Marion Poulter, *Lt. Comdr., USN*
Frances F. Price, *Lt. Comdr., USN*
Helen M. Rhoades, *Lt. Comdr., USN*
Julia M. Sagawe, *Lt. Comdr., USN*
Helen Samonski, *Lt. Comdr., USN*
Laura M. Sanderson, *Lt. Comdr., USN*
Elizabeth B. Seidl, *Lt. Comdr., USN*
Agnes G. Shurr, *Lt. Comdr., USN*
Catherine I. Smith, *Lt. Comdr., USN*
Virginia F. Springer, *Lt. Comdr., USN*
Lina Stearns, *Lt. Comdr., USN*
Lillian Stewart, *Lt. Comdr., USN*
Norma V. Stickles, *Lt. Comdr., USN*
Edna L. Townsend, *Lt. Comdr., USN*
Valera C. Vaubel, *Lt. Comdr., USN*
Marjorie E. VonStein, *Lt. Comdr., USN*
Nancy I. Wallace, *Lt. Comdr., USN*
Kathryn E. Williams, *Lt. Comdr., USN*
Doris A. Wilson, *Lt. Comdr., USN*
Mary I. Wolfgang, *Lt. Comdr., USN*
Gwenevere Woodall, *Lt. Comdr., USN*

Women's Medical Specialist Corps

Joan A. Barnes, *Capt., USA*
Haru Hirama, *Capt., USA*
Eleanor A. Love, *Capt., USA*
Julia A. Neale, *Capt., USA*

AIR FORCE BASE IN PUERTO RICO IS FIRST TO USE FLUORIDATION OF DRINKING WATER

Fluoridation of drinking water at Ramey Air Force Base, Puerto Rico, was initiated on 28 September 1954, largely through the efforts of Colonel Carlos F. Schuessler, USAF (DC), base dental surgeon. Ramey is the first Air Force installation authorized to add fluorides to its water supply.

Brigadier General Alfred F. Kalberer, USAF, right, presses the control that initiates fluoridation at Ramey Air Force Base, Puerto Rico, which he commands. The program was inaugurated by Colonel Carlos F. Schuessler, USAF (DC), left, base dental surgeon.

Following a survey of the 2,500 children at the air base in September 1952, which revealed a higher incidence of dental caries than the average in the United States, action was initiated by Colonel Schuessler to obtain authorization for fluoridation. The initial installation of fluoridation equipment was accomplished for about $3,000, and the yearly maintenance cost is expected to be $200.

"Recent research investigations have shown that decay of teeth in the younger age groups can be reduced by drinking water to which fluorides have been added," Col. Schuessler stated. "It is expected that continuing research and education will encourage civic agencies to recognize the importance of fluoridation. This will aid military bases in obtaining the necessary equipment and fluorides for treating their water supply."

EDITORIAL

Medicine, The Learning Profession

The Hippocratic Oath reminds us to "hand on precepts, lectures, and all other learning to my sons, to those of my master, and to those pupils duly apprenticed and sworn . . . ."

The tradition of teaching has always been inherent in the practice of medicine, and today almost every physician does some "teaching," be it advice to an intern seeing his private patient or the more formal medical school lecture. In essence, all professional discussion between physicians is a mutual learning-and-teaching, and this self-propagation of knowledge is the fundamental basis of the rapid growth and development of modern medicine.

A characteristically American contribution to the technics of medical education is the familiar "CPC." These exercises in diagnostic acumen were founded by Richard Cabot at Harvard about 50 years ago. From clinical-therapeutic case discussions they developed into the present-day valuable correlation of clinical, laboratory, and pathologic knowledge.

Here is the answer to the cry that laboratory men are drifting away from the bedside clinician. Here, in proper form, is brought the combined experience of all variants of the biosciences. When the clinicopathologic conference is not a trick perpetrated on the hapless clinician by the omniscient pathologist, but rather a challenging clinical problem solved by the correlation of laboratory and necropsy observations, the "Cabot Clinics" are without equal as teaching experiences.

With this issue, the *U. S. Armed Forces Medical Journal* will present a CPC each month, as held in an Army, Navy, or Air Force Hospital. We invite your attention to these examples of the application of the best in current medical thinking brought to bear on our ultimate goal—the diagnosis and treatment of the patient.

Medicine, to produce health, has to examine disease.
—PLUTARCH

The more we study the more we discover our ignorance.
—SHELLEY

A MESSAGE FROM THE A. M. A.

Some of the results of the most recent opinion survey conducted by the Council on National Defense of the American Medical Association among physicians released from active military duty appeared in the December issue of the *Journal*. The remainder are summarized here. Of the 1,948 opinion questionnaires sent out during the six months covered by the survey, 1,600 were completed and returned to the Council.

Reserve status. Most physicians (1,037) indicated they retained a reserve commission. The percentage of retentions was highest in the Navy, lowest in the Army.

Distribution by rank at time of discharge. The majority (62.6 percent) of physicians held the rank of first lieutenant or lieutenant junior grade; 33.6 percent held the rank of captain or lieutenant senior grade, and 3.8 percent held the rank of major or lieutenant commander, or higher.

In a breakdown by branch of service, the Navy had the largest percentage of officers in the lowest rank, showing 90 percent as lieutenants junior grade, 7.7 percent as lieutenants senior grade, and less than three percent as lieutenant commanders or higher. In the Army 56 percent were first lieutenants, 37.3 percent were captains, and 6.7 percent were majors or higher; in the Air Force 40.6 percent were first lieutenants, 57 percent were captains, and 2.4 percent were majors or higher.

Government-paid medical education. A total of 1,244 indicated they had received educational assistance from the Federal Government. The Navy V-12 program accounted for 569 of these; 540 participated in the Army Specialized Training Program; 124 received training under the G. I. Bill through the Veterans Administration; and a few listed a combination of various programs.

Training received in service. Of those replying to this question, 465 who had served in the Army, 186 in the Air Force, and 166 in the Navy stated that they had received additional training or experience in service schools. The majority of Army officers mentioned the Basic Course, Medical Field Service School; Air Force and Navy officers indicated the School of Aviation Medicine.

Evaluation of medical military training. The majority of the 1,292 answering this question believed that no important feature of military medicine had been omitted. Basic orientation and indoctrination was stated by 119 to be inadequate, however, and 73 thought that more in-

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—*Editor*

struction in military customs, administration, regulations, et cetera, was desirable. A small number listed several other areas of insufficient training.

Evaluation of assignment. A large majority of the physicians (76.5 percent in the Army, 77.3 percent in the Navy, and 83.3 percent in the Air Force) thought they were properly assigned. In addition, 69.8 percent in the Army, 71.9 percent in the Navy, and 73.7 percent in the Air Force expressed satisfaction with their assignments.

Assignments. One of the questions was designed to determine the amount of time spent by physicians on various types of assignments. Because of incomplete returns, only the amount of time spent on the treatment of military personnel and their dependents in the United States and overseas is reported. Replies showed that at domestic duty stations 38.44 percent of time was spent on military personnel and 28.67 percent on their dependents; overseas, 27.79 percent of time was spent on military personnel and 8.4 percent on their dependents.

Types of nonmilitary medical care. The type of medical care most often performed by medical officers of all three services for nonmilitary persons was outpatient care. Surgery was third in the order of frequency.

Duties that could have been performed adequately by other personnel. Of the 1,437 physicians answering this question, 672 stated that their duties could not have been performed adequately by any other personnel. The 765 (53.2 percent) who believed otherwise listed "other personnel" or "civilian personnel," in that order of frequency, as capable of performing their duties. A small number indicated "nurses" and "enlisted personnel."

Evaluation of staffing conditions. The great majority of answers indicated that staffing conditions for all classes of medical personnel (physicians, dentists, nurses, enlisted personnel, et cetera) were considered adequate. Significantly, 180 in the Navy indicated overstaffing; 47, understaffing; and 193, adequate staffing. In the Air Force, 220 reported overstaffing; 46, understaffing; and 177, adequate staffing. In the Army, 196 noted overstaffing; 135, understaffing; and 329, adequate staffing.

Physicians who would voluntarily remain in service. Of the responses to the question "Under what conditions would you have been willing to serve beyond the required two years?" 28.2 percent stated they would not serve over two years under any conditions, and 66.2 percent indicated a number of reasons for which they would serve an additional period. A small percentage (5.6) did not reply to the question.

If copies of the complete results of this survey are desired, address your request to the Secretary, Council on National Defense, American Medical Association, 535 N. Dearborn St., Chicago, Ill.

OFFICIAL DECORATIONS

LEGION OF MERIT

Frank O. Alexander, *Col., MC, USA*
Elizabeth T. Hanna, *Lt. Col., ANC, USA*
Vinnie H. Jeffress, *Col., MC, USA*
Walter H. Matuska, *Col., MC, USA*
Harold S. McBurney, *Col., MC, USA*
Wendell A. Weller, *Col., MC, USA*

DISTINGUISHED FLYING CROSS

Arthur M. Henderson, *Col., USAF (MSC)*

BRONZE STAR MEDAL

Karl W. Banks, *Maj., MSC, USA*
Stanley M. Baum, *Capt., MC, USA*
George E. Block, *1st Lt., MC, USA*
Francis P. Campbell, *Capt., MC, USA*
Paul L. Clemetson, *1st Lt., MC, USA*
Robert M. Donauer, *Capt., MC, USA*
John A. Evert, *Capt., MC, USA*
George E. Gerkin, *Maj., MSC, USA**
Harry O. Hendrick, *Capt., MC, USA*
Stanley P. Kotchin, *Maj., MSC, USA*
Rudolph Leapheart, *Capt., MSC, USA*
William C. Matousek, *Capt., MC, USA*
Victor S. Messina, *Maj., MSC, USA*
William E. Peterson, *Capt., MC, USA*
Robert C. Reed, *Capt., MC, USA*
Evelyn L. Russel, *Maj., ANC, USA*
Leo W. Saunders, *1st Lt., MSC, USA*
Antonio A. Versaci, *Capt., MC, USA*
Armand A. Wallack, *1st Lt., MC, USA*
William M. Zollman, Jr., *1st Lt., MSC, USA*

COMMENDATION RIBBON

Victor D. Anderson, *Capt., MSC, USA*
Louis B. Arnoldi, *Col., USAF (MC)*
Frances M. Barrett, *Capt., ANC, USA*
Irvin H. Betts, *Lt. (MC) USNR*
Carshal A. Burris, Jr., *1st Lt., MSC, USA*
Delma W. Caldwell, *Maj., MC, USA*
Hsin S. Chung, *Capt., MC, USA*
Richard C. Davison, *2d Lt., MSC, USA*
William E. DeYoung, *2d Lt., MSC, USA*
James T. Farris, *Capt., DC, USA*
John E. Ford, *1st Lt., MSC, USA*
William M. Gale, *Maj., DC, USA*
William E. Garrett, *2d Lt., MSC, USA*
John P. Guion, *2d Lt., MSC, USA**
Ernest G. Guy, *Capt., MC, USA*
Edward H. Hale, *Capt., MC, USA*
Edward T. Harned, *1st Lt., MSC, USA*
Yoshiaki Harunaga, *Maj., DC, USA*
Samuel L. Hoch, *1st Lt., MC, USA*
John F. Howes, *2d Lt., MSC, USA*
Robert J. Kerrigan, *Capt., MSC, USA*
George H. Klumpner, *Capt., MC, USA*
Clarence J. Lafler, *1st Lt., MC, USA*
Paul Lee, *Capt., MSC, USA**
James D. Loveless, *2d Lt., MSC, USA*
James E. Massey, Jr., *1st Lt., MSC, USA*
Leon S. Mezistrano, *1st Lt., MSC, USA*
Marvin R. Mufson, *1st Lt., MC, USA*
Robert A. Parsons, *1st Lt., MC, USA*
Richard E. Raabe, *1st Lt., MSC, USA*
Hamilton W. Ratledge, *Capt., MC, USA*
Marion G. Reis, *2d Lt., MC, USA*
Wiley L. Roberts, *Capt., MSC, USA*
Alice Roth, *Capt., ANC, USA*
David H. Scheffey, *1st Lt., MSC, USA*
John J. Schwab, *Capt., MC, USA*
Edmund L. Sherwood, *Capt., MC, USA*
Jean W. Snider, *1st Lt., MC, USA*
Harry T. Stradford, *Comdr. (MC) USN*
Elizabeth R. Thorne, *1st Lt., ANC, USA*
Gina Trytten, *Capt., ANC, USA*
William W. Tucker, *Capt., MC, USA*
William G. Walker, Jr., *1st Lt., MC, USA*
Helen G. Ward, *Capt., ANC, USA*
Glenn R. Webster, *Capt., MSC, USA*
James P. Whittemore, *Capt., MC, USA*

*Oak Leaf Cluster.

The names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force are published in this department each month following receipt of information from official sources.—*Editor*

REGULAR DENTAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

Since 1930 seven specialty boards have been established with the approval of the American Dental Association to grant certification to qualified dentists. Of these the American Board of Orthodontics was activated first and is the largest. Second in size is the American Board of Oral Surgery which was founded in 1946.

Regular Dental Corps officers of the military services have been certified by the following boards:

American Board of Orthodontics

William H. Day, *Col., USA*

American Board of Periodontology

Joseph L. Bernier, *Col., USA*
Horace A. Brayshaw, *Lt. Col., USA*
Henry B. Fitch, *Lt. Col., USA*
Ernest H. Moser, *Lt. Col., USA*
Merle W. Ogle, *Lt. Col., USA*
Alfred E. Toye, *Col., USA*

American Board of Oral Pathology

Joseph L. Bernier, *Col., USA*
Robert A. Colby, *Comdr., USN*

This is the first of a series. The names of officers certified by the American Board of Oral Surgery will be published in the February issue.

DEATHS

DYAS, Dorothy Emma, Captain, ANC, USAR, U. S. Army Hospital, Fort Hood, Tex.; graduated in 1933 from St. Ann's Hospital School of Nursing, Anaconda, Mont.; appointed second lieutenant and ordered to active duty 24 May 1945; died 5 November 1954, age 47, at Fort Hood of metastatic carcinoma.

SILVEY, James David, Major, MSC, USAR, U. S. Army Hospital, Fort Carson, Colo.; entered the military service 23 November 1936; commissioned second lieutenant 26 September 1942; died 23 October 1954, age 38, at Fort Carson of anaphylactic shock due to penicillin sensitivity.

THE MEDICAL OFFICER WRITES

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Casey, J. B., Comdr. (DC) USN: How to get dental volunteers. *Mil. Surgeon* 115: 338-339, Nov. 1954.

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Crosby, W. H., Lt. Col., MC, USA, and Howard, J. M., Capt., MC, USA: Large transfusions of stored blood. *Modern Med.* 22: 70-71, Aug. 15, 1954.

Donnelly, G. H., Col., MC, USA, and Campbell, R. E., Maj., MC, USA: Surgical aspects of periarteritis nodosa. *A. M. A. Arch. Surg.* 69: 533-539, Oct. 1954.

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Gersema, V. M., Capt., USAF (NC): Lieutenant Leading Fox, Lieutenant Secakuku. *Nursing World* 128: 18-20, Oct. 1954.

Gilmore, H. R., Col., MC, USA: James E. Ash; biographical sketch. *Lab. Invest.* 3: 469-474, Nov.-Dec. 1954.

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Ledbetter, R. K., Jr., Lt. (jg) (MSC) USN: Practicability of Treponema pallidum immobilization test on service-wide basis in U. S. Navy. *Am. J. Syph.* 38: 522-526, Nov. 1954.

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Scalettar, H. E., Capt., USAF (MC); Maisel, J. E.; and Bramson, M.: Acute infectious lymphocytosis. *A. M. A. Am. J. Dis. Child.* 88: 15-24, July 1954.

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Vavala, D. A., First Lt., USAF (MSC), and Orr, K. D., Lt. Col., MC, USA: Alterations of foot-sweat production in frostbite. *Mil. Surgeon* 115: 275-281, Oct. 1954.

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Reviews of Recent Books

PRINCIPLES AND PRACTICE OF ANTIBIOTIC THERAPY, by *Henry Welch.* Specially edited by *Félix Martí-Ibáñez.* 699 pages. Published by Medical Encyclopedia, Inc. Distributed by The Blakiston Co., New York, N. Y., 1954. Price $12.

This outstanding book presents in a remarkably fine manner the latest and best of the historical, chemical, and pharmacological information concerning each antibiotic useful in clinical practice. It is composed of three parts. The first describes the isolation and development of the useful antibiotics, thus affording splendid background material for a comprehensive discussion of the important ones and a dissertation on synergism, antagonism, and hormesis as it pertains to antimicrobial substances. Part II discusses antibiotic therapy of infectious diseases, which are properly grouped and are discussed by outstanding authorities in their respective fields. Part III is entitled "Antibiotic Therapy in Medical Specialties," and covers ophthalmology, pediatrics, oral surgery, and dentistry.

The organization of the book and its bibliographies and index are well-done. The volume is one of the finest in this field that has been written in recent years. It seems impossible that a 700-page book could be so up-to-the-minute; the manuscripts of the author and collaborators appear to have been current up to November 1953. This accomplishment in editing and publishing has resulted in the inclusion of all new antibiotics of interest to the clinician.

I strongly recommend this book for medical libraries and clinicians.

—*WILBUR C. BERRY, Col., MC, USA*

FUNDAMENTALS OF INTERNAL MEDICINE, by *Wallace Mason Yater,* M. D., M. S., with the assistance of *William Francis Oliver,* M. D. 4th edition. 1,276 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1954. Price $13.50.

In this new edition of a well-known textbook of medicine, the author and his fellow contributors accomplished remarkably well their purpose of "the presentation of the fundamentals of internal medicine in a simple, concise yet comprehensive form . . . Thus in this one volume will be found the essentials of medical practice exclusive of surgery, obstetrics, and the limited specialties."

The various diseases are presented by systems in 20 sections, including ones on diseases of the skin, the ear, and the eye which usually are not found in a textbook of medicine. Six additional sections include those on dietetics, antibiotics and sulfonamide com-

pounds, symptomatic and supportive treatment, inhalational therapy, useful tables, and "the physician himself." Frequently throughout the text pertinent points are summarized for emphasis. The illustrations, photographs, charts, and tables are excellent and suitable references are given at the end of each section.

Although this book is evidently written primarily for medical students, because of its conciseness interns, residents, and practitioners will find it helpful, and a timesaver.

—*PATRICK I. McSHANE, Col., MC, USA*

THE DIAGNOSIS AND TREATMENT OF CONVULSIVE DISORDERS IN CHILDREN, by *Samuel Livingston*, M. D. 320 pages; 92 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $9.50.

This new monograph, intended primarily for the general practitioner of medicine, is based on the combined clinical and electroencephalographic studies of over 4,000 children with convulsive disorders observed in the epilepsy clinic of the Johns Hopkins Hospital. The various types and causes of convulsive disorders are described and the differential diagnosis and treatment discussed in detail. Emphasis is given to epilepsy as the chief offender in the production of the convulsive state. In the chapter on drug therapy, anticonvulsant drugs are described, with recommendations as to their usage in various types of conditions, dosage, and possible untoward reactions.

The discussion of dietary treatment is interesting though controversial. Some other observers are less enthusiastic than the author regarding the value of the ketogenic diet in certain types of epilepsy. The section on electroencephalography is well done, but would seem to be of less value to the average general practitioner than most of the other material offered. Of particular interest is the detailed discussion of febrile convulsions, as well as the section dealing with the treatment of the child during an actual convulsion. A chapter on the surgical treatment of epilepsy is excellent.

The book is beautifully organized and is printed with easily readable type. The subject matter is presented in an orderly, cohesive, and interesting manner. Each chapter concludes with an extensive bibliography, and there is an excellent author and subject index. This book is highly recommended to all who are confronted with the complex problem of convulsions in children. — *THOMAS L. DUFFY, Comdr. (MC) USN*

ANATOMY OF THE BRONCHOVASCULAR SYSTEM, by *George L. Birnbaum*, M. D. 300 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $15.

The author expressed as his original purpose the preparation of an atlas with line drawings of normal and abnormal patterns of the pulmonary vascular system. In order to cover the field thoroughly he has written a book on the surgical anatomy of the bronchovascular system with presentation of the significant aspects of embryology, anatomy, pathology, cardiology, and experimental and clinical surgery.

The volume contains a comprehensive review of the literature with numerous references and quotations throughout the text. The author has cited anomalies in detail with representative drawings of various abnormalities, and included a number of case histories. Significant aspects of experimental and clinical surgery are discussed, and important operations are outlined in detail.

The book is indexed and well organized, and the illustrations are made up of drawings and photographs almost entirely in black and white. There is an excellent bibliography. Because the author has quoted widely from the literature and presented the views of many observers, not everyone will agree with all of his conclusions. Nevertheless this book will be valuable because of the large amount of important information contained on the developments in thoracic surgery.

—*CARL W. HUGHES, Lt. Col., MC, USA*

THE AMERICAN TEXTBOOK OF OPERATIVE DENTISTRY, edited by *Arthur B. Gabel,* M. A., D. D. S. 9th edition. 626 pages; with 422 illustrations. Lea & Febiger, Philadelphia, Pa., 1954. Price $10.

Maintaining the high standards of the previous editions, the contributors to this textbook, who are outstanding leaders in their respective fields, present a critical survey of the most recent developments in operative dentistry. Due stress has been placed on the mechanical approach to operative procedures, a phase many practitioners often treat lightly. The author's discussion of this subject is basic, and is presented in a clear, concise manner. Various biologic aspects are correlated with proper emphasis.

The section found in previous editions on "Dentistry for Children" has been omitted, because of the editor's belief that the present scope of this specialty includes not only operative procedures but also numerous other related services. The discussion of operative dentistry from a diagnostic standpoint is well-conceived, and can be summed up by the following quotation, "The evaluation of the extent to which dental disease may influence the health of a patient is one of the most serious responsibilities of the dental profession."

The style, organization, and format are appealing, not only to the student, but also to the teacher and general practitioner. The 422 illustrations are neatly prepared and are thoroughly explained. The index offers quick reference. The bibliographies and the list for supplementary reading afford access to many better-known texts and much research data, which is in keeping with the thoroughness of the authors.

Operative dentistry may be justly considered the first line of defense against most dental diseases and their sequelae, though in discharging his professional obligations the dentist must have more than a knowledge of his immediate field. This text affords the student and practitioner an excellent opportunity to better serve his patient and profession.— *EDWARD R. HILDRETH, Comdr. (DC) USN*

CORONARY HEART DISEASE IN YOUNG ADULTS, by *Menard M. Gertler*, M. D., and *Paul D. White*, M. D. 218 pages; illustrated. Harvard University Press, Cambridge, Mass., 1954. Price $5.

This book describes an exhaustive study of 100 patients with coronary occlusion, all less than 40 years old. The study was made by a group of investigators, each of whom had a different approach to the problem. A matched control group of equal size and a larger unmatched control group also were studied. The controls appear to have been selected to approach the patients as nearly as possible in a number of characteristics. The main spheres of investigation centered in clinical appraisal, family incidence and racial background, anthropometric and morphologic appraisal, athletic activity and occupations, findings on masculinity, endocrine and biochemical findings, dietary factors, and the oxidation-reduction potentials of saliva.

The significant evidence which emerged from this three-year study supported the original thesis of the group; namely, that coronary heart disease is caused by various factors, rather than by one critical variation from the normal. It indicates that a consideration of sex; body build; morphologic characteristics; heredity; serum total cholesterol; serum uric acid; the ratio of serum total cholesterol to serum lipid phosphorus; an index derived from the relation of serum uric acid, serum total cholesterol, and serum lipid phosphorus; and the salivary redox potential; should result in the selection of coronary-prone persons. It seems unlikely that any one factor will accurately delineate this group.

The authors have been wise in not attempting to extend their study into the field of therapeutics. The discussions of theories of the cause of atherosclerosis are sufficient to point up the investigation being reported, but are not overly detailed. As a result, the reader is carried without diversion to the final evaluation of the results.

The graphs and tables are clear, and summarize well an enormous mass of data. References appear after each chapter and the index is adequate.

This type of publication is of great value at a time when the number of articles published on the subject exceeds the reading capacity of the average physician. It is of value also because of the wide selection of experts in varied fields.—*RALPH C. PARKER, Jr., Capt. (MC) USN*

ANESTHESIA IN GENERAL PRACTICE, by *Stuart C. Cullen*, M. D. 4th edition. 312 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $5.

The original intent of the author of this book was to make available to the medical student and part-time anesthetist a practical text on anesthesia. The fact that there have been four editions in 8 years—with the second edition being reprinted twice and the third edition once—indicates that the author has succeeded.

All the usual phases of anesthesia practice are discussed in a dogmatic and practical fashion. The text may be read and understood by the general practitioner; but the specialist may find it elementary. Multiple technics are not included, nor are detailed discussions of minor facts of anesthesia. The present edition has brought the material up to date. This book is highly recommended for medical students and beginning anesthesiology residents as a text to read and study. It should be added to the medical library of each teaching institution.

—*SCOTT WHITEHOUSE, Comdr. (MC) USN*

LYLE AND JACKSON'S PRACTICAL ORTHOPTICS IN THE TREATMENT OF SQUINT (And Other Anomalies of Binocular Vision), 4th edition, revised by *T. Keith Lyle*, M. D., M. Chir.; assisted by *Marianne Walker*, D. B. O. (T.). 371 pages; 195 illustrations including 3 colored plates. The Blakiston Co., Inc., Philadelphia, Pa., 1953. Price $12.

This book contains a general discussion of strabismus with emphasis on orthoptic training. The theoretical precepts are based on the writings of Chavasse. Various orthoptic devices are described in sufficient detail to permit practical application, with emphasis on those used in the office rather than on the home training methods. Both surgery and orthoptic training is used in the treatment of squint. A particularly noteworthy chapter deals with the treatment of paralytic squint and contains a very complete and lucid description of the methods of diagnosis. The style of the book is somewhat heavy and requires considerable concentration to read; however, the explanatory diagrams are exceedingly well done. There are 60 references. It is believed that the book is very valuable for both ophthalmologists and orthoptic technicians. —*JOHN E. EDWARDS, Lt. Col., MC, USA*

LEGAL MEDICINE, edited by *R. B. H. Gradwohl*, M. D., Sc. D. 1,093 pages; 222 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $20.

This excellent volume is one of the very few that portrays completely the relationship between medicine and law. The subject matter is complete and modern and the data, based on current legal statutes, is exact, trustworthy, and reliable. The editor, who is also the author of four chapters, had the collaboration of 29 outstanding experts in forensic science, and all facets of the subject are well planned. Considering the breadth of medical jurisprudence today, the authors have presented their collected thoughts in a remarkable manner and have contributed greatly to the subject of forensic medicine. The reader is thus enabled to better understand this new and exact science.

The text is divided into 39 chapters; all are necessary to fulfill the editor's mission and there is little or no overlapping. The style, format, and organization of subject matter are excellent. The 222 well-selected illustrations are of outstanding quality. Each chapter is well referenced and the book is beautifully indexed.

This text will prove of value to all physicians regardless of their specialties and particularly to those who may be called to testify

in court. This book will also be valuable to students, law-enforcement officers, criminologists, and to most members of the legal profession interested in the subject. This volume should be in the library of every practicing pathologist and scientist working in toxicology.

—*RALPH M. THOMPSON, Col., USAF (MC)*

OFFICE GYNECOLOGY, by *J. P. Greenhill*, M. D., F. A. C. S. 6th edition. 517 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $7.75.

The sixth edition of this book, written by an authoritative practicing gynecologist, is directed to the general practitioner, but also purports to provide the gynecologist with a ready source of all he should know concerning the practice of gynecology in an office or outpatient surgery. Although several new chapters have been added, this edition still falls considerably short of the author's goal. Many subjects, such as sterility, endocrinology, menstrual irregularities, pelvic inflammatory disease, hysterosalpingography, and uterotubal insufflation, are treated superficially. Emphasis is given less important subjects, such as mechanical conception control.

The conversational style has continuity, but the organization of the subject matter is poor. An example of this is the inclusion of a new chapter on diseases of the vulva, while discussions of specific diseases of the vulva such as condyloma acuminatum, pruritus vulvae, and kraurosis vulvae remain in isolated chapters. The few illustrations, in several instances, are chosen from commercial sources. They add little to the clarity or completeness of the presentation. The index is adequate. The absence of a bibliography limits the book's usefulness as a reference.

This volume can be read with advantage by the general practitioner, but probably will prove to be inadequate for him as a reference on office gynecology. It will have relatively less value for most gynecologists.

—*DWIGHT A. CALLAGAN, Comdr. (MC) USN.*

PSYCHOMOTOR ASPECTS OF MENTAL DISEASE, by *H. E. King*, Ph. D. 185 pages; illustrated. Harvard University Press, Cambridge, Mass., 1954. Price $3.50.

This book presents the details of systematic observations of one phase of psychomotor activity which are of interest in the consideration of psychomotility in mental disease. It is very adequately implemented with 21 figures, 21 tables, a subject index, and an appendix containing the clinical history forms and the rating scales used, and the wiring diagrams of the test apparatus.

The objective in this experiment was to test more thoroughly the existence of a possible relation between psychomotor function and behavior disorder, and to examine in greater detail any positive trends which might emerge. The subjects tested included a group of patients with a chronic mental disease (schizophrenics), a group with subacute mental disease (pseudoneurotic schizophrenics and neurotics), and a

group without disease. The author describes in considerable detail how groups were selected for the study and also the test procedures. The focus of the study is on fine movement (hand and finger actions), but gross movements are included in the observations of psychomotor activities by subjects with mental disorders. He includes the only broad review of the experimental literature related to this topic, citing 142 references.

The data recorded in this experiment offer a clear demonstration of defective fine psychomotor performance in patients with a behavior disorder, and a direct relationship of considerable subtlety between speed in fine psychomotor performance and the degree of disorder present. There are indications that the psychomotor defect appears to increase with the severity of the disease process.

This volume should be of interest to psychologists, psychiatrists, neurologists, and neurophysiologists.

—*PHILLIP B. SMITH, Lt. Col., MC, USA*

NEW AND NONOFFICIAL REMEDIES, Containing Descriptions of the Articles which Stand Accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1954. Issued Under the Direction and Supervision of the *Council on Pharmacy and Chemistry, American Medical Association.* 609 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $2.65.

This well-known book is published annually. The primary objective of the Council, appointed by the Board of Trustees of the American Medical Association to consider medicinal and allied preparations offered for prophylactic, diagnostic, or therapeutic use by the physician, is to encourage the practice of rational therapeutics. As in the past, the drugs accepted for inclusion in the book are arranged according to pharmacologic action. There are 24 separate sections of drugs so arranged. A typical monograph for a drug includes the chemical or official name, the commercially available preparations of the drug, the strength and potency, forms in which available, and the pharmaceutical houses manufacturing the item. There is also a short description of the drug, with its actions, uses, and dosage.

The first portion of the book contains such information as official rules governing admission of drugs, criteria for the evaluation of certain products, labeling requirements, decisions of the Council that may be of general interest, and a table of metric doses with approximate apothecary equivalents. An innovation is the publication of lists of drugs omitted and of new drugs added since the previous edition. The section entitled "Bibliography of Unaccepted Products" was omitted from this edition. The book continues to contain an index to distributors of accepted items and a complete general index.

This book provides the physician with such information concerning the actions, usage, limitations, and dosage of acceptable and relatively new drugs as will promote the practice of rational therapeutics.

—*HENRY D. ROTH, Lt. Col., MSC, USA*

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THE DIAGNOSIS AND TREATMENT OF THE INFERTILE FEMALE, by *Fred A. Simmons*, M. D. 83 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $2.50.

This concise monograph dealing with the problems encountered in diagnosing and treating conditions producing infertility in the female is divided into 20 chapters, and contains 83 pages, with seven figures and three tables. The author's style provides effortless reading, and he has included only important and necessary steps in the systematic approach to problems of sterility.

The chapters devoted to diagnosis are complete, and emphasize the need for a preconceived plan of action to be followed by the examiner in his quest for the cause of infertility in each and every patient. Likewise, the sections devoted to treatment are adequate—they contain the most modern thinking on the subject and properly caution the reader regarding the anticipated low salvage in cases stemming from endocrine deficiencies other than thyroid.

The chapters on artificial insemination and adoption contain much useful and important information, stating the problem unequivocally and with dispatch.

The last chapter presents the more important psychosomatic causes of infertility.

This small, well-written monograph will be of particular value to the student and general practitioner, but will prove a ready source of reference for the specialist in obstetrics and gynecology. It rightfully belongs in the libraries of all physicians treating sterility of the female patient.—*WILLIAM S. BAKER, Jr., Comdr. (MC) USN*

CLINICAL ROENTGENOLOGY, Volume II, The Head, Neck, and Spinal Column, by *Alfred A. de Lorimier*, M. D.; *Henry G. Moehring*, M. D.; and *John R. Hannan*, M. D. 488 pages; 734 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $18.50.

This monograph is volume 2 of a four-volume set, and covers the clinical roentgenology of the head, neck, and spinal column. These divisions of the body are discussed through multiple clinical entities found by practicing roentgenologists. This is a rather unusual method of classification because of the possibility of omission; however, the authors have succeeded admirably in covering the field by including all of the most common lesions encountered in these sections of the body. The anatomic and roentgenologic findings are well correlated with the clinical evidence of abnormality.

There are excellent sections on the use of contrast material, angiography, encephalography, and ventriculography. Of special note is a large section on dental radiography and diagnosis, not duplicated elsewhere.

Each section is brief, to the point, and well-organized. Each subject is discussed under specific headings, such as: general considerations,

roentgen manifestations, clinical manifestations, laboratory co-operation, and differential considerations. Pertinent references are included. The volume is fully and beautifully illustrated with excellent examples of the subject matter. From a technical standpoint, these include some of the finest cuts of radiographs that the reviewer has seen. The book is adequately indexed to permit easy reference to any particular problem.

The authors are to be congratulated on such an excellent presentation. This volume is a welcome addition to any medical library as an excellent reference for either specialist or novice.

—*SYLVESTER F. WILLIAMS, Capt. (MC) USN*

TEACHING IN THE OUTPATIENT DEPARTMENT, by *Sister Mary Isadore Lennon*, R. N., M. A. 240 pages; illustrated. G. P. Putnam's Sons, New York, N. Y., 1954. Price $4.

This book on outpatient department teaching is divided into four major units: concepts basic to outpatient department work, education program, integration of social and health aspects, and evaluation of the teaching program. The appendixes deal with family studies, budgets, well-child conferences, and the qualifications and duties of outpatient department personnel. Of the 42 illustrations, those representing interrelationships of outpatient divisions, records of patient care, and records of student experience and evaluation are good. Perhaps some of the photographs could be clearer from the standpoint of subject matter and technic.

Sources of related visual-aid materials are presented with most of the sections. At the end of each subsection there is a time-saving terminology list. References are numerous and timely, about one third of them dated 1950 or later. One error in terminology appears in the section on injection technic for the diabetic patient, where "sterilize" is used in relation to directions for surgically cleansing the skin.

To administrators, the author offers the challenge of further improving understanding between hospital and community agencies regarding their co-operative functions in caring for the sick. Her point of view as practitioner as well as scholar embraces the care of the entire patient with all his needs, the full development of the student nurse, and the team concept of personnel relationships.

—*LILLIAN B. SCHOONOVER, Lt. (NC) USN*

ANATOMY FOR SURGEONS: VOLUME I. THE HEAD AND NECK, by *W. Henry Hollinshead*, Ph. D. 560 pages; 326 illustrations. Paul B. Hoeber, Inc., New York, N. Y., 1954. Price $12.

This volume deals with the regional anatomy of the head and neck for the practicing surgeon, and is not a complete descriptive anatomic text. It is intended as a review of basic anatomy and as a refresher of those details necessary for the mature surgeon. These objectives are admirably accomplished.

The book is divided into nine sections on the cranium; orbit; ear; nose and paranasal sinuses; fascia and fascial spaces of the head and neck; face; jaws; palate and tongue; pharynx and larynx; and neck. In each section the subject matter is well-organized and covers the essential anatomic principles. Also—and this is what makes the book especially valuable to the surgeon—the major anomalies and variations are given; embryologic, physiologic, and neurophysiologic correlations are presented; and recent anatomic and clinical work is included. The operative approaches to various regions and the position of those structures easily injured during operations is well-presented. The presentation throughout is from the standpoint of the operating surgeon.

The illustrations are simple and clear. There is a bibliography of appropriate references at the end of each section, and the index is adequate.

This book is well-named and is truly a clinical surgical anatomy. It should prove a welcome companion for the operating surgeon, and is highly recommended for surgical residents and especially for general surgeons.— *JOSEPH J. ZUSKA, Capt. (MC) USN*

LABORATORY AIDS IN ENDOCRINE DIAGNOSIS, by *Roberto F. Escamilla*, M. D. American Lecture Series, Publication Number 212, A Monograph in The Bannerstone Division of American Lectures in Endocrinology. Edited by *Willard O. Thompson*, M. D. 131 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $4.75.

This is a short but useful text covering the laboratory methods that frequently aid in the diagnosis and treatment of endocrinopathies. As the author points out, these technics are for the most part only aids or adjuncts in diagnosis, and in following the effects of the treatment of endocrine diseases. Information concerning such diseases that can be obtained from the usual laboratory tests is reviewed. The technics and critiques of the various special metabolic studies, urine hormone tests, special tests of blood, sperm counts, testicular biopsies, vaginal smears, and roentgenographic examinations are well presented. The endocrine disease index in the final chapter should prove most useful to interns, residents, and all physicians who see patients with endocrine disorders.—*ROBERT E. BLOUNT, Col., MC, USA*

DISEASES OF THE SKIN, by *Oliver S. Ormsby*, M. D., and *Hamilton Montgomery*, M. D., M. S. 8th edition, thoroughly revised. 1,503 pages; with 666 figures containing 750 illustrations and 18 colored illustrations on 11 plates. Lea & Febiger, Philadelphia, Pa., 1954. Price $22.

This latest revision of an outstanding standard text and complete reference source should be available to all medical libraries and owned by all doctors interested in skin diseases. The bulk of the book makes it cumbersome to read, but the text is concise and the subjects are well-indexed.

The superior features of the older editions, *i. e.*, the histopathology and multiple clear illustrations, have been retained with necessary revisions. The sections on physiology, chemistry, and diseases of the sweat glands are markedly improved and demonstrate the great changes in basic sciences since the previous edition. The section on syphilology has been reduced in scope but is adequate for today's needs. Nelson's treponemal immobilization test for the diagnosis of syphilis, however, is not adequately described, nor are its uses explained. Pigmentation and the diseases associated with it are newly included, with the latest treatments. Extensive additions are noted on two hitherto fatal diseases, pemphigus and lupus erythematosus, with emphasis on the newest diagnostic tests. The portion concerning mycology is of general interest to all physicians and includes the latest laboratory work on this difficult subject.

This book represents a magnificent monument to the late senior author.—*EDWARD F. GUDGEL, Maj., MC, USA*

PRACTICAL FLUID THERAPY IN PEDIATRICS, by *Fontaine S. Hill*, M. D. 275 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $6.

This book was evidently written for clinicians who have not kept abreast with the current literature concerning fluid and electrolyte balance in the human body, and in particular for those physicians concerned with the treatment of infants and children. The elementary principles of the physiology of water and electrolytes in the human body are presented in the first section. The bedside application of these principles for various clinical conditions with considerable repetition for the purpose of emphasis is discussed in the second section of the book.

The third and shortest section of the book is devoted to technics of obtaining blood specimens from, and administering parenteral fluids to, infants and young children. These technics are suitably illustrated. An adequate bibliography and index are included. This book is suitable for students and interns, and for others who might desire to review the subject.—*PATRICK I. McSHANE, Col., MC, USA*

THE PAINFUL PHANTOM, Psychology, Physiology, and Treatment, by *Lawrence C. Kolb*, M. D. 50 pages. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $1.50.

The first section of this monograph is devoted to a description of the phantom phenomena, and the second section to case illustrations, and a summary of existing theories and data relative to the psychophysiology of the painful phantom.

The author provides evidence to indicate that the existence of a nonpainful phantom is a healthy psychologic response following any amputation of a limb or other body part. Subsequent to an ampu-

tation, the psychologically healthy person slowly reorganizes his body image by means of the new sensory experiences related to the changed body form and the phantom gradually disappears. It may persist or reappear if a physical defect, irritating the afferent nerves, is present. Its persistence in the absence of an organic factor, and the failure of the limb amputee to make the necessary psychologic and social adjustments, indicates a pre-existing personality disturbance. The chronicity of the pain and its refractiveness to heroic therapy leads the author to conclude that it is psychologically maintained. This is further confirmed by the response to psychiatric therapy. Analysis of the underlying dynamics reveals hostility and dependency to be important factors. The opinion is expressed that the postoperative phenomena of an acutely painful phantom with attendant behavior disturbance constitutes a psychiatric emergency.

This small volume should prove valuable to both surgeon and psychiatrist; it indicates the need of a combined therapeutic approach on the part of both, in the management of the painful phantom.

—JOHN J. KAVANAGH, Maj., USAF (MC)

A DYNAMIC PSYCHOPATHOLOGY OF CHILDHOOD, by *Lauretta Bender*, M. A., M. D. 275 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $7.50.

This volume, the third in the Bellevue Studies of Child Psychiatry, in no way provides the broad foundation for understanding the various problems of emotional development in childhood that its title seems to promise. In a narrower sense, however, it does delve into "various areas of psychopathological responses" by presenting a wealth of fascinating clinical material. Most of this has appeared earlier, but its current presentation is deemed warranted because of follow-up studies several years later. Although well aware of the difficulties involved in obtaining follow-up evaluation of any sort, I was disappointed in the generally cursory and inconclusive nature of most of these later studies.

The sections on hallucinatory experiences, imaginative companions, and internalization of fantasy objects are worth-while reading, not only for the psychiatrist but for anyone else who works with children and needs to understand them. The positive attitude taken toward these experiences, in considering them efforts on the part of the child to experience a satisfactory reality in the face of an obviously unsatisfactory one, is refreshing when so often any expression of fantasy life is looked upon as evidence of a pathologic process.

The discussion of impulsions, obsessions, and compulsions offers much of value to the child psychiatrist and also contains many concepts especially useful to the military psychiatrist. I found the sections treating of sexual expression of identification conflicts full of surprising and interesting case material, but lacking in constructive interpretation or practical applicability.

An article of particular general interest at this time is one treating of the effect of comic books on the ideology of children. Originally written in 1941 by the author and Dr. Reginald Lourie, and modified only slightly in its present printing, it takes the view that such publications offer children an opportunity to work out their relationships to the social group—a sort of spoon-fed dream life—and that as such they have definite positive value. There is room for considerable controversy. For example, the article advises comic-book artists to avoid depicting "actual mutilation or violence or death" as occurring "in relationship to any character with which the child can identify himself or his parents or his 'cause.' Nor should any such act be committed by such a character . . . *unless the situation can be morally justified*" (italics mine). Shades of the Inquisition and the Salem witch hunt!

The article on the personality of Lewis Carroll, as derived from Alice's adventures and written by Paul Schilder in 1938, has no legitimate place in this volume nor has the section on "childrens' reactions to war," which is labored, artificial, and (because it represents more nearly a reaction to a questionnaire concerning war than to war itself) of doubtful validity and value.

The volumes of this series could be improved by severe editing to achieve better continuity, less repetition, and a more nearly uniform over-all viewpoint. On the whole, however, this book should be a "must" on the reading list of any psychiatrist treating children or handling character disorders in adults.—*JAMES N. SUSSEX, Comdr. (MC) USN*

NECK DISSECTIONS, by *James Barrett Brown*, M. D., and *Frank McDowell*, M. D. American Lecture Series, Publication Number 207, A Monograph in The Bannerstone Division of American Lectures in Surgery. 163 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $7.50.

The subject of definitive therapy of cancer of the head and neck is an extremely broad one to be so adequately covered in a small text. The authors describe the method of a complete examination of the head and neck of a patient presenting himself with a carcinoma. Step by step, the reader is led through the examination of the cancer and at the same time an examination of associated parts, including vessels and lymph system near and distant to the original site. Even in this day of a "cancer conscious" lay public, this latter portion of the examination is too frequently neglected by physicians to whom patients first present themselves. After the primary site is located, the reader is then led through the indications for and limitations of neck dissection. Once the decision is made to resort to surgery there is a concise, excellently presented description of the preoperative measures, the technic of unilateral dissection, unilateral plus supraomohyoid dissection of the opposite side, and bilateral upper dissection, accompanied by excellent illustrations in color. This section is followed by a description of the postoperative care and the results to be ex-

pected. Of special note is the section on neck dissection and jaw resection with an illustrated description of implants and grafts to preserve oral physiology.

This book is of special interest to general surgeons, plastic surgeons, oral surgeons, dentists, and otolaryngologists because it outlines the only definitive therapeutic course to be followed if cancer is to be cured. In advocating dispensing with the term "prophylactic neck dissection" the authors have taken an extremely desirable step because in over 30 percent of patients without palpable lymph nodes small metastases were present histopathologically, thereby making the procedure a necessary one.

The authors dwell on the elimination of the necessity of tracheotomy in surgical procedures of the mouth, jaw, and neck. This policy may cause the younger, less experienced surgeon to postpone this procedure until the very last, thus necessitating an emergency tracheotomy instead of permitting an orderly, planned procedure which the patient would be in better physical condition to withstand. Tracheotomy is a simple procedure and in most instances should be performed prophylactically.

The bibliography is complete and more than adequate to make any oncologist and surgeon thoroughly conversant in the field of cancer. This is an excellent text because of the straightforward teaching manner in which it is presented, leaving no doubt in the mind of the reader as to the course of therapy to follow to decrease the mortality rates in cancer of the head and neck.

—*FRANK A. PERRI, Lt. Col., USAF (MC)*

MEDICAL USES OF CORTISONE, edited by *Francis D. W. Lukens*, M. D. 534 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1954. Price $7.50.

This excellent book is a summation and appraisal of the experiences, observations, and studies of 29 outstanding specialists regarding the physiology, pharmacology, and clinical effects of cortisone, hydrocortisone, and corticotropin, both systemic and topical, during the five years these substances have been available. Their employment in all the specialties is well-covered, and the editor deserves much credit for condensing into one small volume the current concepts of these authorities. They are both factual and practical.

The fundamental theme of the book is that, while these products cure no disease, they afford gratifying relief. It is agreed that there is a valuable place in therapeutics for drugs such as these in combating those diseases "which do not take life but just ruin it." Complications, side effects, and contraindications are well delineated, and the displacement of cortisone by hydrocortisone is foreshadowed. Some of the authors have added the reports of others to their own vast ex-

perience. The bibliographies of a number of chapters contain 500 references or more.

The chapters on physiology, pharmacology, collagen diseases, asthma, dermatology, and ophthalmology are particularly good. The chapter on rheumatoid arthritis is disappointing because of the meager review of rheumatoid spondylitis and the illustrations of dosage schemes (figs. 22, 23, and 24), which are simplified to absurdity. The authors, however, place emphasis on tailoring therapy to the individual, and remind the reader that although the steroids and corticotropin may cause side effects, the diseases they alleviate are often disabling.

This book will prove a most valuable reference and guide to all who prescribe cortisone, hydrocortisone, and corticotropin.

—*JULIAN LOVE, Capt. (MC) USN*

DEPRESSION, edited by *Paul H. Hoch,* M. D., and *Joseph Zubin,* Ph. D. 277 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $5.50.

This work comprises the proceedings of the forty-second annual meeting of the American Psychopathological Association in New York City in June 1952. The symposium on depression is presented as a series of separate papers representing many different approaches and disciplines for its study. The 20 contributors and six discussants are well-known in the field and they cover a broad approach to the study of depression.

The reader may not find much that is new to him. The workers in each field have reviewed the progress or, in some cases, lack of it, and presented theories for future investigation. The coverage is broad but as, is stated, some fields are not included because no new work is in progress, or because suitable contributions were not available for the symposium. The symposium indicates that the causes of depression have not been discovered. There has been considerable progress, however, in understanding the dynamics of depression. Diverse approaches have revealed significant relationships among the many disciplines that will eventually lead to a knowledge of the obviously multidetermined causes.

Psychiatrists and interested workers in allied fields will find this book a helpful review of the various studies of the problem of depression. The scientist who may have become isolated in his own approach to the problem is given an opportunity to see what his colleagues are doing. The bibliographies are extensive and candidates for the American Board Examination in Psychiatry will find them helpful in their review. The appendix includes a list of officers and members of the American Psychopathological Association.

—*ROBERT L. WILLIAMS, Maj., USAF (MC)*

THE YEAR BOOK OF PATHOLOGY AND CLINICAL PATHOLOGY, edited by *William B. Wartman*, M. D. 485 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

The presentation of material in this Year Book follows the same format as the 1952 edition; however, this edition is about one-fifth larger in size.

The extracts are selections from 1953 publications covering all fields of pathology and clinical pathology. The editors have succeeded extremely well in selecting out of the large field of publications only those articles of general interest to the pathologist. Numerous photographs and charts are included.

The book is highly recommended. It should be of value to all pathologists.

—*RUSSELL H. WALKER, Capt. (MC) USN*

THE DOCTOR WRITES, An Anthology of the Unusual in Current Medical Literature, edited by *S. O. Waife*, M. D., F. A. C. P. 175 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $3.75.

Few physicians, other than professional editors, had the time and good fortune to read all of the 17 articles reprinted in this small anthology when they first appeared in medical journals during 1953. Only one editor had the enterprise to put between covers these "unusual" articles from the current literature so that they could be enjoyed by those who missed them earlier.

Each piece deviates in its own direction from ordinary scientific reports. One author presents a remarkable amount of medical lore culled from the Bible. Another dispels the myth that many great physicians, now dead, possessed superior clinical acumen over today's practitioners. From one of A. Conan Doyle's teachers in medical school, Dr. Joseph Bell, the reader learns something about Sherlock Holmes' powers of deduction as a dermatologist. Others include: the strange story of Dr. Albert Abrams, the second American to write a book on the heart (1900), who became a colossal quack; the bitter controversy that followed Roentgen's famous discovery; a sensible plea to reduce multiple authorship of scientific articles; and a few tricks of showmanship in medical teaching. The best, in my opinion, is "An Unusual Obstetrical Case History; Derived from the Pen of W. Shakespeare." Here the humor is high, and "unusual" is the understatement of the year.

This is the kind of a book which bears occasional rereading because it does not age. It reveals unsuspected literary skill among physicians who have strayed off the beaten oath for their themes. Best of all, it is interesting—in a day when so much that it written is not. Dr. Waife, now a member of the staff of this *Journal*, has produced a book that will be enjoyed by everyone who reads for pleasure.

—*ROBERT J. BENFORD, Col., USAF (MC)*

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

FUNDAMENTALS OF INTERNAL MEDICINE, by *Wallace Mason Yater*, A. B., M. D., M. S. (In Med.), F. A. C. P.; Director, Yater Clinic, Washington, D. C.; Formerly Professor of Medicine and Director of the Department of Medicine, Georgetown University School of Medicine; Physician-in-Chief, Georgetown University Hospital; Physician-in-Chief, Gallinger Municipal Hospital, Washington, D. C.; and Fellow in Medicine, Mayo Foundation, Rochester, Minn. This edition prepared with the assistance of *William Francis Oliver*, B. S., M. D., A. A. C. P.; Staff Member, Department of Medicine, Santa Barbara Clinic; Consultant, Santa Barbara General Hospital; Attending Physician, Cottage Hospital; Attending Physician, St. Francis Hospital, Santa Barbara, Calif. 4th edition. 1,276 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1954. Price $13.50.

THE STUDY OF THE BRAIN, A Companion Text to the Stereoscopic Atlas of Neuroanatomy, by *Hyman S. Rubinstein*, M. D., Ph. D., D. A. B. P. N., F. A. P. A., Attending Physician in Neurology and Psychiatry, United States Army Hospital, Aberdeen Proving Ground; Associate Physician (Neurology and Psychiatry) Sinai Hospital; Formerly Director, Alfred Ullman Laboratory for Neuropsychiatric Research and Head of the Division of Neurology and Psychiatry, Department of Medicine, Sinai Hospital, Baltimore, Md. Foreword by *Carl L. Davis*, M. D., Professor Emeritus of Anatomy, School of Medicine, University of Maryland, Baltimore, Md. 209 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1953. Price $9.50.

LIVER INJURY, Transactions of the Twelfth Conference, September 21, 22, and 23, 1953, Princeton, N. J., edited by *F. W. Hoffbauer*, M. D., Associate Professor, Department of Medicine, University of Minnesota Hospitals, Minneapolis, Minn. 231 pages; illustrated. Sponsored by the Josiah Macy, Jr. Foundation, New York, N. Y. Printed in the United States of America by Corlies, Macy & Co., Inc., New York, N. Y., 1954. Price $4.25.

MYOCARDIAL INFARCTION, Its Clinical Manifestations and Treatment with Anticoagulants, A Study of 1,031 Cases, by *Irving S. Wright*, M. D., *Charles D. Marple*, M. D., *Dorothy Fahs Beck*, Ph. D. This is a report of the Committee on Anticoagulants, created by The American Heart Association, and reflects that Committee's findings in the matter under Study. 656 pages; illustrated. Published for The American Heart Association by Grune & Stratton, Inc., New York, N. Y., 1954. Price $8.50.

RELIGION AND SOCIETY, by *Elizabeth K. Nottingham*, Queens College. Doubleday Short Studies in Sociology, SSS 5. Consulting Editor, *Charles H. Page*, Professor of Sociology, Smith College. 84 pages. Doubleday & Co., Inc., Garden City, N. Y., 1954. Price $0.95.

THE STATUS OF MULTIPLE SCLEROSIS, Annals of The New York Academy of Sciences, Volume 58, Art. 5, pages 541-720, July 28, 1954. Editor, *Roy Waldo Miner;* Conference Chairman, *Pearce Bailey;* Organizing Chairman and Consulting Editor, *Harold R. Wainerdi.* 180 pages; illustrated. The New York Academy of Sciences, New York, N. Y., 1954. Price $4.50.

PROPERTIES OF SURFACES, Annals of The New York Academy of Sciences, Volume 58, Art. 6, pages 721-970, September 15, 1954. Editor, *Roy Waldo Miner;* Conference Chairman and Consulting Editor, *Cecil V. King.* 249 pages; illustrated. The New York Academy of Sciences, New York, N. Y., 1954. Price $3.50.

THE THEMATIC APPERCEPTION TEST AND THE CHILDREN'S APPERCEPTION TEST IN CLINICAL USE, by *Leopold Bellak,* M. D., with the assistance of *Marjorie Bristol.* 282 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $6.75.

MODERN OCCUPATIONAL MEDICINE, edited by *A. J. Fleming,* M. Sc., M. D., Assistant Medical Director, E. I. duPont de Nemours and Company, and *C. A. D'Alonzo,* M. D., F. A. C. P., Special Assistant, Medical Division, E. I. duPont de Nemours and Company. Associate Editor, *J. A. Zapp,* Ph. D., Director, Haskell Laboratory for Toxicology and Industrial Medicine, E. I. duPont de Nemours and Company. 414 pages; 44 illustrations, 2 in color; 32 tables. Lea & Febiger, Philadelphia, Pa., 1954. Price $10.

THE MICROPHYSICAL WORLD, by *William Wilson,* Ph. D. (Leipzig), D. Sc. (London), F. R. S., Fellow of King's College, London, and Professor Emeritus of Physics in the University of London. 216 pages; illustrated. Philosophical Library, Inc., New York, N. Y., 1954. Price $3.75.

THE YEAR BOOK OF PEDIATRICS (1954-1955 Year Book Series), edited by *Sydney S. Gellis,* M. D., Assistant Professor of Pediatrics, Harvard Medical School; Senior Physician, Children's Medical Center, Boston, Mass.; Pediatrician-in-Chief, Beth Israel Hospital, Boston, Mass. *Isaac A. Abt,* M. D., Editor Emeritus. 431 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

PRINCIPLES OF INTERNAL MEDICINE, Editors: *T. R. Harrison, Raymond D. Adams, Paul B. Beeson, William H. Resnik, George W. Thorn,* and *M. M. Wintrobe.* 1,703 pages; illustrated; with 87-page index. 2d edition of student one-volume edition. The Blakiston Co., Inc., New York, N. Y. 1954. Price $16.

INTRODUCTION TO SURGERY, by *Virginia Kneeland Frantz,* M. D., Professor of Surgery, College of Physicians and Surgeons, Columbia University; Attending Surgical Pathologist, Presbyterian Hospital, New York; and *Harold Dortic Harvey,* M. D., Associate Professor of Clinical Surgery, College of Physicians and Surgeons, Columbia University; Associate Attending Surgeon, Presbyterian Hospital, New York. 3d edition. 233 pages. Oxford University Press, New York, N. Y., 1954. Price $4.

THE YEAR BOOK OF GENERAL SURGERY (1954-1955 Year Book Series), edited by *Evarts A. Graham,* A. B., M. D., Emeritus Professor of Surgery, Washington University School of Medicine; formerly Surgeon-in-Chief of the Barnes Hospital and of the Children's Hospital, St. Louis; with a section on Anesthesia, edited by *Stuart C. Cullen,* M. D., Professor of Surgery and Chairman of Division of Anesthesiology, State University of Iowa College of Medicine and Hospitals. 500 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

THE DEVELOPMENT OF MODERN SOCIOLOGY, Its Nature and Growth in the United States, by *Roscoe C. Hinkle, Jr.*, and *Gisela J. Hinkle*, University of Rochester. Doubleday Short Studies in Sociology, SSS 6. Consulting Editor, *Charles H. Page*, Professor of Sociology, Smith College. 75 pages. Doubleday & Co., Inc., Garden City, N. Y., 1954. Price $0.95.

THE COLON: ITS NORMAL AND ABNORMAL PHYSIOLOGY AND THERAPEUTICS, Annals of The New York, Academy of Sciences, Volume 58, Art. 4, pages 293-540, July 15, 1954. Editor, *Roy Waldo Miner;* Organizing Chairman; *M. L. Tainter;* Conference Chairman, *Thomas P. Almy;* Consulting Editor, *M. L. Tainter.* 247 pages; illustrated. The New York Academy of Sciences, New York, N. Y., 1954. Price $4.50.

MEREDITH'S HYGIENE, A Textbook for College Students on Physical, Mental, and Social Health from Personal and Public Aspects, by *Arthur P. Davis*, B. S., Ed. M., Dr. P. H., Professor of Physical Education, The Pennsylvania State University, and *Warren H. Southworth*, B. S., M. A., Dr. P. H., Professor of Health Education, The University of Wisconsin. 5th edition. 906 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1954. Price $6.

THE YEAR BOOK OF MEDICINE (1954-1955 Year Book Series), edited by *Paul B. Beeson*, M. D., *Carl Muschenheim*, M. D., *William B. Castle*, M. D., *Tinsley R. Harrison*, M. D., *Franz J. Ingelfinger*, M. D., and *Philip K. Bondy*, M. D. 711 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

UNIVERSITY EDUCATION FOR ADMINISTRATION IN HOSPITALS, A Study Inaugurated by the Association of University Programs in Hospital Administration, A Report of the Commission on University Education in Hospital Administration, 1954. 199 pages. Published by American Council on Education, Washington, D. C., 1954. Price $3.

BIOCHEMICAL DETERMINANTS OF MICROBIAL DISEASES, by *René J. Dubos*, The Rockefeller Institute for Medical Research. 152 pages. Harvard University Press, Cambridge, Mass., 1954. Price $3.50.

PSYCHOLOGY IN NURSING PRACTICE, 2d edition. *Lester D. Crow*, Ph. D., Associate Professor of Education, Brooklyn College; *Alice Crow*, Ph. D., Assistant Professor of Education, Brooklyn College; *Charles E. Skinner*, Ph. D., Professor of Education, New York University. 435 pages; illustrated. The Macmillan Co., New York, N. Y., 1954.

BABIES ARE HUMAN BEINGS, An Interpretation of Growth, by *C. Anderson Aldrich*, M. D., Late Professor of Pediatrics, Mayo Foundation, Graduate School, University of Minnesota, and *Mary M. Aldrich*. 2d edition. 122 pages; illustrated. The Macmillan Co., New York, N. Y., 1954. Price $2.95.

SMOKING AND CANCER, A Doctor's Report, by *Alton Ochsner*, M. D., President, American College of Surgeons, 1951-1952; President, American Cancer Society, 1949-1950; President, American Association for Thoracic Surgery, 1947-1948. 86 pages; illustrated. Julian Messner, Inc., New York, N. Y., 1954. Price $2.

THEORY AND PRACTICE OF CROWN AND BRIDGE PROSTHESIS, by *Stanley D. Tylman*, D. D. S., M. S., F. A. C. D., Professor of Prosthetics, Head of the Department of Fixed Partial Dentures, University of Illinois, College of Dentistry, Chicago, Ill. 1,017 pages; with 1,364 text illustrations and 9 color plates. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $16.

FIXED PARTIAL PROSTHESIS, by *Joseph E. Ewing,* D. D. S., F. A. C. D., Professor of Crown and Bridge Prosthesis, Temple University, School of Dentistry, Philadelphia, Pa. 208 pages; 482 illustrations. Lea & Febiger, Philadelphia, Pa., 1954. Price $6.

SURGICAL TREATMENT OF CANCER OF THE CERVIX, edited by *Joe V. Meigs,* M. D., Clinical Professor of Gynecology, Harvard Medical School; Chief of Staff of the Vincent Memorial Hospital, A Gynecologic Service affiliated with the Massachusetts General Hospital; Surgeon, Pondville Hospital; Gynecologist, Palmer Memorial Hospital. 462 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1954. Price $12.

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